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Dawn or dusk of the 5th age of research in educational technology? A literature review on (e-)leadership for technology-enhanced learning in higher education (2013-2017)

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Abstract

The aim of this article is to establish the extent to which the concept of e-leadership has taken off as a lens through which to study leadership for technology-enhanced learning (TEL) in higher education. Building on a previous study conducted in 2013, this article thus covers an exploratory review of the literature for the period 2103-2017. It analyses 49 articles which explore both the specific concept of e-leadership as well as other work dealing more generally with leadership and organisational change for TEL in higher education. The findings show that while none of the empirical studies identified in the literature refer explicitly to e-leadership, there are a number of interesting insights to be found in the theoretical articles. The results also highlight the widely different interpretations and applications of the concept of e-leadership and the consequent need for the definition to be refined. The paper concludes with recommendations for further multidisciplinary research at the intersection of the fields of educational technology and educational management, focusing on values, strategy, organisation and leadership interactions at meso level, the economy and public policy at macro level, and teaching and learning at the micro level, as well as for research in Leadership Development for TEL.

Keywords: e-leadership, higher education, technology-enhanced learning, online learning, distributed leadership, change management

Introduction

Technology has been part of the educational landscape for decades, and one could argue that even chalk and the blackboard are forms of technology appropriated for learning, as indeed are books. However, within the scope of this paper, the term technology is used to refer to digital technology as "a system that combines computers, telecommunications, software and rules and procedures or protocols" and media (text, graphics, audio and video, which involve the creation, communication and interpretation of meaning (Bates, 2015). Technology-Enhanced Learning (TEL) is to be understood as the use of technology in any teaching and learning situation, on a continuum from face-to-face to fully online learning (Bates & Sangrà, 2011). The rapid pace of development of digital technologies has already disrupted many industries and sectors, most notably the music industry (Moreau, 2013; Rogers, 2013), hotels and taxis

(D'Emidio, Dorton, & Duncan, 2015; Suzor & Wikstrom, 2016) and it is not infrequent to hear claims that the next area to be seriously challenged will be that of higher education (HE) (Barber, Donnelly, & Rizvi, 2013; Craig, 2015; Lucas Jr., 2016; Shirky, 2012), though Selwyn (2013) offers a critical analysis, as do Weller and Anderson (2013).

Universities in general, and European universities in particular, have survived in their more or less current form for several hundred years, yet currently face a number of challenges: the wide availability of knowledge on the web, massification and greater diversity of students, a decline in public funding coupled with rising student debt in many countries (Barber et al., 2013; Boyer, 2016; Staley & Trinkle, 2011). While technology is not the only solution to these challenges, it has been suggested that HE leaders need to develop a better understanding of the potential of TEL coupled with a high level of strategic thinking (Bates & Sangrà, 2011).

This is often associated with the theory of e-leadership, initially developed by Avolio, Kahai, and Dodge (2001) in the context of the business world, where e-leadership is defined as "a social influence process embedded in both proximal and distal contexts mediated by AIT [Advanced Information Technology] that can produce a change in attitudes, feelings, thinking, behavior, and performance." (Avolio, Sosik, Kahai, & Baker, 2014) as updated from the initial definition (Avolio et al., 2001).

This study aims to establish the extent to which the concept of e-leadership has taken off as a lens through which to study leadership for TEL in HE. The approach taken is that of an exploratory literature review in that it aims to identify what research has been published in the period 2013-2017 in terms of theory, empirical evidence and research methods with respect to the topic in question. It is situated at the intersection of different disciplinary fields: leadership within the wider field of management and business studies, and TEL within the education and educational research field. It is thus necessary to establish the current state of knowledge at this point of overlap. As Jameson (2013) states:

> …the many scholarly educational research and professional communities that span the liminal edges bordering the two fields of educational technology and leadership do not, for the most part, relate to or recognise each other's work very much. (Jameson, 2013, pp. 891-892).

In addition to answering the primary research question of establishing the extent to which e-leadership has taken off as a lens through which to study leadership for TEL in HE, the results are also analysed in terms of the following secondary research questions:

- What is the geographical distribution of research in the field? Is it concentrated in a particular region and, if so, are there any gaps to be filled?
- In which disciplinary fields (journals) are these studies being published?
- What thematic trends can be identified in comparison with those identified by Jameson (2013)?
- What populations within HE (formal leaders, teachers, students,…) are being studied with respect to leadership for TEL? Are they considered in isolation or as part of a wider multi-stakeholder perspective?
- What is the level of analysis (project level, single institution, multiple institutions)?
- What methodologies are being applied?

Finally, if we understand leadership as a highly context-dependent social influence process, where there is a need to investigate "real organizational life" (Alvesson, 2017, p. 11) the last three questions are taken in combination to explore how this is taken into account through the methodology, the populations studied and the level of analysis.

The place of leadership in the literature on TEL and online learning

Examining the developments within TEL research over time, Winn (2002) defines four ages of such research as (1) instructional design with a focus on content; (2) differentiated message design focused on format, (3) simulation with a focus on learner control, interaction, scaffolding of student learning and constructivist principles; (4) a focus on technology-supported artificial learning environments, distributed cognition and the social nature of learning in communities. In the period 2002-2014, Baydas, Kucuk, Yilmaz, Aydemir, and Goktas (2015) identify a focus mainly on learning approaches/theories and (online) learning environments, albeit in a literature review restricted to two UK journals (BJET, the British Journal of Educational Technology and ETR&D, Educational Technology Research and Development).

In the field of distance and online education, Zawacki-Richter and Naidu (2016) identify waves of alternating institutional and individual research over the past 35 years from articles published in the journal Distance Education: professionalization and institutional consolidation (1980–1984), instructional design and educational technology (1985–1989), quality assurance in distance education (1990–1994), student support and early stages of online learning (1995–1999), the emergence of the virtual university (2000–2004), collaborative learning and online interaction patterns (2005–2009), and interactive learning, MOOCs and OERs (2010–2014). It would thus seem that the next institutional wave is somewhat overdue.

Indeed, in an extensive literature review covering the period 2000 to 2013, in both the management and the education fields, Jameson (2013) concludes with a call for a 5th age in educational technology research, where e-leadership in higher education is the focus.

Updating Jameson's 2013 literature review

In order to bring the literature review up to date and provide a current picture of the state of the art, searches were carried out in four major databases between October 2017 and February 2018, for the period 2013-2017.

Method

Jameson used the following combinations of search terms:

A) e-leadership AND "higher education" AND "educational technology"
B) leadership AND "higher education" AND "educational technology".

For the purposes of updating the literature review for the period 2013-2017, these same combinations were used in ISI Web of Science, Scopus, ERIC (selected for their relevance to the field) and Google Scholar (selected in order to widen the search as far as possible).

In order to check for results which may not have been found through the two aforementioned combinations and, given the complexity of conducting literature review in

the field of educational technology due to the wide variety of terms used by researchers and practitioners (Pretto & Curró, 2017), a concept map (Keeble & Kirk, 2007) was created in order to delimit the study (Fig. 1). The central topic of (e-)leadership was broken down into three main components in order to:

- identify synonyms or alternative terms relevant for extending the search, in particular with respect to TEL;
- identify key authors from both the leadership and TEL fields for the theoretical background;
- to delimit the study in terms of education sector (HE) and to facilitate exclusion of non-relevant results.

With respect to these exclusions, a prior initial search resulted in a high number of results pertaining to school leadership, leadership education programmes, health leadership and virtual team leadership, all of which were deemed out of scope for this literature review.

Finally, the concept map included an identification of populations in HE concerned with TEL leadership, as both leaders and followers, as well as of the different levels of analysis. These last two areas were used to categorise the results in the analysis phase.

In referring to the challenges of conducting literature reviews in the IT, ICT and educational technology fields, Pretto and Curró (2017) draw attention to the need for judicious selection of key search terms. With respect to educational technology, the authors list commonly-used alternatives such as technology-enhanced learning (TEL), digital technologies, instructional technology, blended learning, online learning, digital learning, while Wheeler (2012) identifies the use of TEL, e-learning and digital learning. Bayne (2015) points out that TEL is quite specific to the UK, with some usage in European contexts, and that on a global scale the terms 'instructional technology', 'educational technology' and 'e-learning' still dominate. While the importance of assumptions behind the use of particular terms needs to be recognised, as highlighted by both Pretto & Curró and Bayne, a full analysis of these is beyond the scope of this current study.

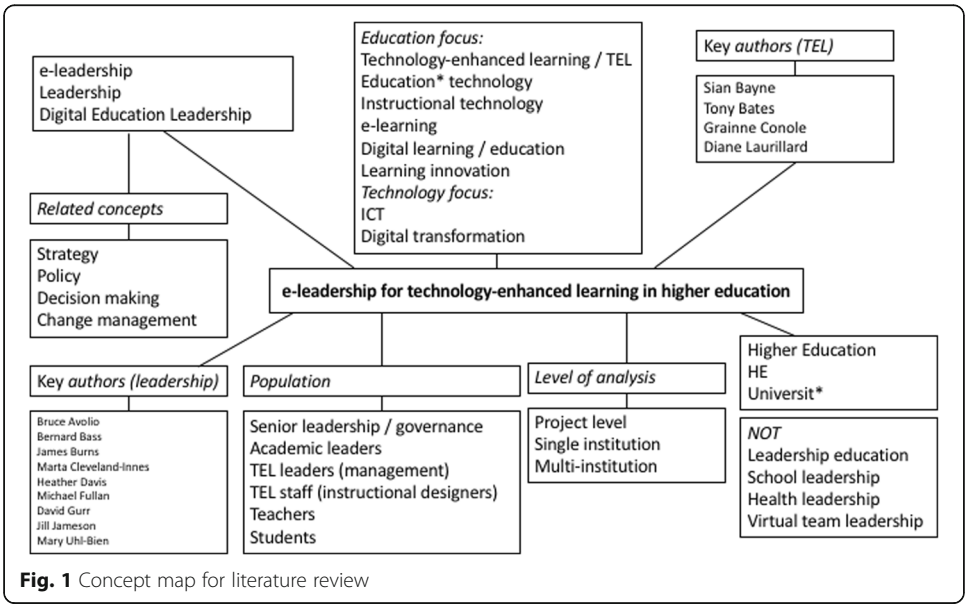

Fig. 1 Concept map for literature review

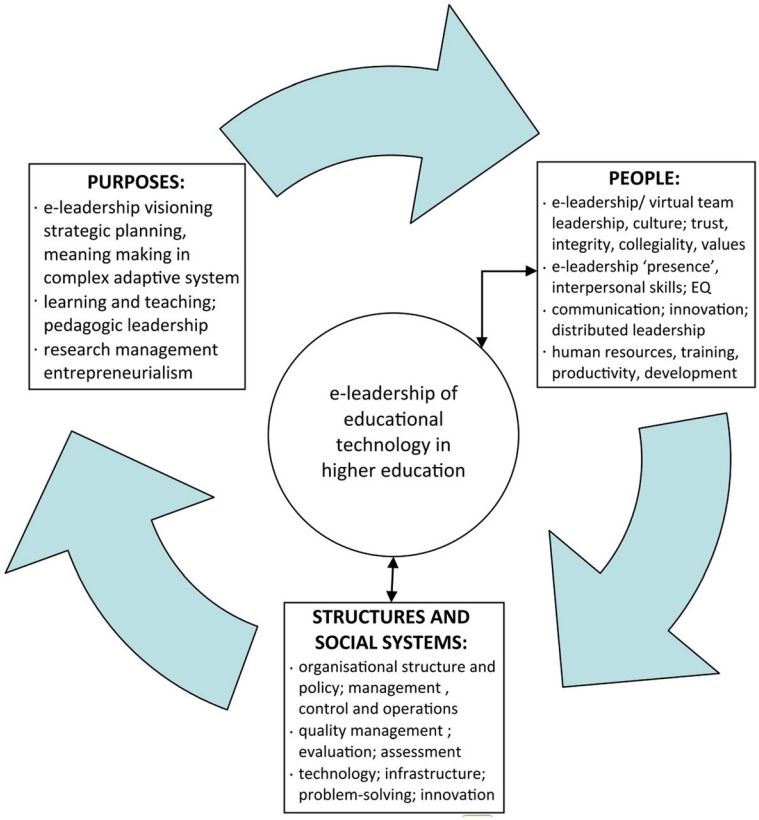

Fig. 2 e-Leadership framework for educational technology in higher education (Jameson, 2013, p. 911)

Finally, in addition to the aforementioned concept map, the TEL e-leadership framework developed by Jameson (Fig. 2) was taken as the basis for conducting a trend analysis, checking for reference to the existing concepts as well as for additional themes emerging from the literature in the period 2013-2017.

Results

Overall, the search resulted in the following initial results (Table 1).

A total of 843 results were screened based on title, keywords and abstract (where available). The results from all searches were first winnowed down to exclude those not covering leadership or related concepts at all. A second winnowing excluded results which were considered off-topic, dealing with schools, the health sector, gaming or information systems. The Google Scholar search proved the most challenging, as despite the inclusion of higher education and an attempt to filter out books and schools, these still appeared in the results, alongside results pertaining to business. Another issue with the Google Scholar search was in bringing up results which had clearly not been peer-reviewed and the impossibility of defining this in the search criteria. Given the time frame for this study, it was only feasible to screen the first search for "e-leadership" AND "higher education" AND "education* technology" within the first 100 results obtained via Google Scholar, and the first 20 results of the other searches.

The final results, after identifying duplicates obtained via different searches and across the different databases, are as follows:

Table 1 Search results for peer-reviewed articles since and including 2013

	Database used			
Search combination	ISI Web of Science	Scopus	ERIC	Google Scholar
e-leadership AND "higher education" AND "education* technology"	1	1	3	250
e-leadership AND "higher education"	3	2	7	929
leadership AND "higher education" AND "education* technology"	7	10	29	19 200
Leadership AND "higher education" AND "TEL"	0	0	2	16 800
Leadership AND "higher education" AND "ICT"	7	17	15	15 000
Leadership AND "higher education" AND "e-learning"	10	18	28	16 400
Leadership AND "higher education" AND "digital"	20	3	37	17 000
Leadership AND "higher education" AND "technology-enhanced learning"	2	1	2	5 520
Leadership AND "higher education" AND "instructional technology"	0	1	2	10 800
Leadership AND "higher education" AND "learning innovation"	1	1	8	3 100
Leadership AND "higher education" AND "digital transformation"	1	1	0	1 100
"Digital transformation" AND "higher education"	5	3	2	1 500
Leadership AND "higher education" AND "technology"	27	110	116	24 500
TOTAL number of results screened	84	168	251	340

Forty-nine articles, 48 of which we can be confident have been peer-reviewed. The non-peer-reviewed result is a concept paper (Brown, Czerniewicz, Huang, & Mayisela, 2016) retained for its highly relevant selection and analysis of digital education leadership competency and literacy frameworks. Identified via the Google Scholar search, its status was checked in ERIC which only produced it as a result after including non-reviewed papers in the search.

After detailed analysis of the main body of the articles, and in particular of the methodology section where present, the results were classified according to the following three categories: empirical studies (where clearly-defined populations were studied according to recognised research methodologies); theoretical analyses (reviews of leadership and related theories, applied to higher education but with no empirical study); and opinion pieces (articles expressing author's opinions based on personal experience with no or only nominal reference to underlying theory). These categories can be related to the main types of scientific publication, where empirical studies come under the umbrella of research papers or original research, theoretical analyses belong to the 'review article' category and opinion pieces can be considered as viewpoints (Öchsner, 2013). As such viewpoints or opinion papers are not always peer-reviewed, the status of all results obtained in this category was double-checked in ERIC, confirming that they had indeed been peer-reviewed.

The non-empirical studies (theoretical articles and opinion pieces) were included in this literature review to give a fuller picture of the type of research being published in the field of (e)-leadership for technology-enhanced learning in higher education. More specifically, theoretical articles can provide insights into how scholars are approaching the question from a broader angle, and opinion pieces can give insights into the preoccupations of leaders and other stakeholders as they reflect on challenges and leadership practice from a strategic or organisational perspective.

The 49 results are thus comprised of:

- 27 empirical studies (ES), one of which from 2013 had already been identified by Jameson (Garrison & Vaughan, 2013)
- 16 theoretical analyses (TA)
- 6 opinion pieces (OP)

Figure 3 below presents the number and type of results per year of publication.

While empirical studies are the most widely represented in total over the 5-year period (55%), no obvious trend in the development of such research can be detected in the results, apart from a peak in 2015. Theoretical analyses, which often propose models that have not been tested empirically, appear to be relatively popular forms of presenting research about e-leadership in higher education (33%), followed by opinion pieces (12%).

Two major differences with respect to Jameson's 2000-2013 literature review should be noted here: firstly, the inclusion of opinion pieces which reflect how and where (e-) leadership is being written about in relation to TEL in HE, and secondly that only results pertaining to higher education were retained, whereas Jameson included results from other phases of education due to the lack of results obtained for HE.

Detailed presentation of results

The following three tables present a summary of the results, organised into the three categories. The tables provide the reference of the publication, information about location, population, context and methodology together with a summary of the findings (Tables 2, 3, and 4).

Analysis of results

From the three aforementioned tables, the empirical studies were analysed from the perspectives of geographical location, methodologies used and populations studied in relation to leadership, in order to answer the corresponding secondary research questions indicated earlier. Additional analysis identified the leadership theories or terms associated with leadership for the overall results. A series of concept matrices (Webster & Watson, 2002) were used in order to perform this analysis, to identify themes and trends and to produce the associated tables and figures.

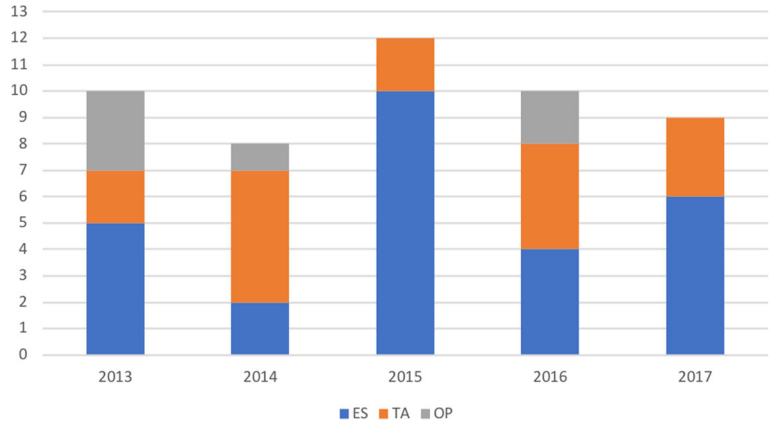

Fig. 3 Number and type of results per year

Table 2 Results: Empirical studies

Empirical studies 2013-2017	Location / population / methodology	Findings
Akcil et al. (2017). An Examination of Open and Technology Leadership in Managerial Practices of Education System. *EURASIA Journal of Mathematics Science and Technology Education*, *13*(1), 119–131.	Location not specified / 153 education managers / quantitative analysis of survey data.	Finds that technology acceptance and self-efficacy in technological development have influence on forming digital citizenship; and that digital citizenship and self-efficacy in technological leadership have influence on forming open leadership.
Ashbaugh (2013). Expert Instructional Designer Voices: Leadership Competencies Critical to Global Practice and Quality Online Learning Designs. *Quarterly Review of Distance Education*, *14*(2), 97–118.	US/Canada / 6 expert instructional designers / phenomenological study, Delphi-style, narrative inquiry study.	Concludes that leadership from instructional designers has the potential for significant impact on the quality of online higher educational products. Provides a Model of Leadership for Instructional Design - Competencies / Attributes / Duties => Strategy, Vision, Personality (Interpersonal Skills), Productivity, Emotional/Psychological Strength, Values, Duties.
Bälter (2017). Moving Technology-Enhanced-Learning Forward: Bridging Divides through Leadership. *International Review of Research in Open and Distributed Learning*, *18*(3).	Sweden / 12 participants (PhD students, teachers, support staff) / explorative case study, qualitative analysis of interviews	Existence of divides between academic subjects and competences, mistrust of support staff due to divides relating to academic level, divides in attitudes towards teaching. Proposes the application of Appreciative Inquiry as a leadership strategy to bridge these divides (Orr & Cleveland-Innes, 2015).
Bervell and Umar (2017). A Decade of LMS Acceptance and Adoption Research in Sub-Sahara African Higher Education: A Systematic Review of Models, Methodologies, Milestones and Main Challenges. *EURASIA Journal of Mathematics, Science and Technology Education*, *13*(11), 7269–7286.	Sub-Sahara Africa / meta-analysis of 31 studies / quantitative	Among the challenges identified in the 31 studies, Leadership/ management support and policy (11.7% each) were found to be in joint 4rd place after IT infrastructure (21.7%), skills and training (21.7%) and system related challenges (13.3%). Concludes with recommendations for leadership and management of higher education institutions to allocate funds towards a more intentional ICT infrastructural development and periodic skills training in LMS usage, coupled with a definite policy framework, as well as to sensitize instructors and students on the benefits, usefulness and importance of using LMS in instructional delivery.
Bogler et al. (2013). Transformational and Passive Leadership. *Educational Management Administration & Leadership*, *41*(3), 372–392.	Israel / single HEI (Open Uni) / students (n=1270) / quantitative study	Examines the effects of transformational and passive leadership styles of university instructors on students' satisfaction and learning outcomes, using Full Range Leadership Theory. Satisfaction was linked to a high score for transformational leadership associated with a low score for passive leadership. Highlights the fact that perception of the leader might be more significant than the actual behaviour of the (online instructor) leader.

Table 2 Results: Empirical studies *(Continued)*

Empirical studies 2013-2017	Location / population / methodology	Findings
Brown (2013). Large-scale innovation and change in UK higher education. *Research in Learning Technology*, *21*, 1–14.	UK / 5 HEIs / methodology not stated	Analyses 5 curriculum redesign projects in the light of current theories and models of change management (formulated as top-down, bottom-up, distributed leadership). Argues for collaborative approaches to project management as opposed to top-down bottom-up approaches.
Burnette (2015). Negotiating the mine field: Strategies for effective online education administrative leadership in higher education institutions. *The Quarterly Review of Distance Education*, *16*(3), 13–35.	USA / Online Education Administrators, multiple HEIs (n=12) / Qualitative inquiry	Identifies two main political challenges faced by online education administrators: being bound by tradition and struggling for authority. Also identifies the strategies used to overcome these challenges: building relationships, building trust and credibility, finding common ground, empowering faculty and using data to drive change.
Ciabocchi et al. (2016). A Study of Faculty Governance Leaders' Perceptions of Online and Blended Learning. *Online Learning*, *20*(3), 52–73.	USA / faculty governance / online survey (n=129) + follow-up questions by email to 9 self-selected participants	Provides insights into the perceptions of faculty governance on matters related to online and blended learning: focus on teaching, quality and approval, staff development, overuse of adjuncts.
Cifuentes and Vanderlinde (2015). ICT Leadership in Higher Education: A Multiple Case Study in Colombia. *Media Education Research Journal*, 133–141.	Colombia / ICT leaders & team members, faculty / Multiple case study / Mixed methods (semi-structured interviews, focus groups, document analysis, survey (n=348)	Identifies the main struggles of ICT leaders as a lack of institutional regulations and the challenge of bringing about educational change in the face of reluctance. Concludes the need for distributed leadership.
Davis and Higgins (2015). Researching Possible Futures to Guide Leaders Towards More Effective Tertiary Education. *Journal of Open, Flexible and Distance Learning*, *19*(2), 8–24.	New Zealand / 16 local and international experts / Scenario building: semi structured interviews, document analysis brainstorming workshops	Created a collective scenario organised around tensions between facing academia/the disciplines and facing employers and the professions, and standardised versus customised education. 4 scenarios: articulation, supermarket, quality-branded, self-determined.
Díaz and Báez (2015). Exploración de la capacidad de liderazgo para la incorporación de TICC en educación: validación de un instrumento. *RELATEC - Revista Latinoamericana de Tecnología Educativa*, *14*(3), 35–47.	Mexico / 6 experts (5 Mexico + 1 USA) / rating of items => Quantitative analysis using Content Validity Index (CVI).	Validated an instrument to explore leadership capabilities for ICT in education, consisting of 31 items divided into four variables: digital competence, visionary leadership, strategic leadership and contextual intelligence.
Domingo-Coscollola et al. (2016). Do It Yourself in Education: Leadership for Learning across Physical and Virtual Borders. *International Journal of Educational Leadership and Management*, *4*(1), 5–29.	Spain, Finland, Czech Republic / Schools and Higher Education, teachers, students and parents / Qualitative – document analysis, focus groups	Finds that HE teachers have more freedom than school teachers to innovate in the classroom but that highly-fragmented curricula and rigid timetables represent barriers. Focuses on teachers leading learning rather than institutional governance.
Garrison and Vaughan (2013). Institutional change and leadership associated with blended learning innovation: Two case studies. *The Internet and Higher Education*, *18*, 24–28.	Canada / two case studies / practical inquiry, community of inquiry	Documents two cases of the development of blended learning from the point of view of institutional change and leadership. Concludes the need for committed collaborative leadership engaging all levels of the institution, with clear vision, specific action plans, teaching recognition and adequate resource allocation.

Table 2 Results: Empirical studies *(Continued)*

Empirical studies 2013-2017	Location / population / methodology	Findings
Holt et al. (2015). Framing and enhancing distributed leadership in the quality management of online learning environments in higher education. Distance Education, 35(3), 382–399.	Australia, national project / senior leaders at each partner institution / semi-structured interviews	Examines leaders' understandings of distributed leadership in the context of quality management of Open Learning Environments. Confirms the existence of a gap between the existence of distributed leadership, and the acceptance of its meaning and value. Concludes the need for deliberative formal top-level leadership commitment and action in order to instil distributed leadership.
Inayatullah and Milojevic (2014). Augmented reality, the Murabbi and the democratization of higher education: alternative futures of higher education in. *On the Horizon*, *22*(2), 110–126.	Malaysia / 50 lecturers and deans / Action research foresight workshop	Presents recommendations from a 5-day foresight workshop in 8 categories: establishment of a pilot project; enhancement of digital teaching and learning processes; customization of degrees; changing of the culture in higher education; enhancing collaboration; supporting research activities; rethinking of dominant frames of reference; anticipating upcoming futures trends.
King and Boyatt (2015). Exploring factors that influence adoption of e-learning within higher education. *British Journal of Educational Technology*, *46*(6), 1272–1280.	UK / single HEI / phenomenological approach, faculty-based focus groups and individual interviews	Identifies factors influencing the adoption of e-learning: institutional infrastructure, staff attitudes and skills, perceived student expectations, the importance as perceived by participants of an institutional strategy which provides sufficient resources and guidance. Recommends that such a strategy needs to be supported by a staff development programme and opportunities for sharing practice.
Livingstone (2015). Administration's perception about the feasibility of elearning practices at the University of Guyana. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)*, *11*(2), 65–84.	Guyana / single HEI, administrators / mixed methods case study, online survey analysed quantitatively and qualitatively	Explores the perceptions of the University's administration regarding the feasibility of developing elearning. Concludes that the perceptions are generally favourable but that educational practices in general need to be improved, and that issues regarding technical infrastructure and support need to be addressed.
Ng'ambi and Bozalek (2013). Leveraging informal leadership in higher education institutions: A case of diffusion of emerging technologies in a southern context. *British Journal of Educational Technology*, *44*(6), 940–950.	South Africa / 22 HEIs, educators and non-academics (n=259) / online survey analysed qualitatively (and quantitatively at a superficial level)	Studies the uses of emerging technologies to transform the teaching and learning practices and the nature of institutional support. Refers to diffusion of innovation theory (Rogers, 2003; Rogers & Scott, 1997). Concludes the need for more transformative and less transactional leadership. Proposes a wheel model for accelerating the diffusion of innovation and emerging technologies in HEIs, recommending that formal leaders work with opinion leaders and change agents.

Table 2 Results: Empirical studies *(Continued)*

Empirical studies 2013-2017	Location / population / methodology	Findings
Roushan et al. (2016). The Kaleidoscope of Voices: An Action Research Approach to Informing Institutional e-Learning Policy. *Electronic Journal of E-Learning*, *14*(5), 293–300.	UK / single HEI / two-spiral action research approach	Concludes that the success of TEL integration depends on strong research and technological leadership, building internal alliances with key stakeholders, focusing on the 'middle out' and a partnership approach to working with students, all of which contribute to a transformational and shared approach to institution-wide change.
Sheiladevi and Rahman (2016). An Investigation on Impact of E-Learning Implementation on Change Management in Malaysian Private Higher Education Institutions. *Pertanika Jouornal of Science and Technology*, *24*(2), 517–530.	Malaysia / HE educators (n=487) / Quantitative analysis of survey data	Finds that variables of change management ("stakeholders involvement", "system view", "evolving mindset", "understanding transition", "system design" and "system evaluation") influence three aspects of e-learning implementation: "ownership and control", "academic transform", and "service and satisfaction". Concludes with the need to construct a vision and a mission that resonate with teachers, relating it to teaching and learning.
Singh and Hardaker (2017). Teaching in Higher Education Change levers for unifying top-down and bottom- up approaches to the adoption and diffusion of e- learning in higher education. *Teaching in Higher Education*, *22*(6), 736–748.	UK / 5 HEIs / qualitative exploratory case studies, interview with senior e-learning leaders, heads of academic departments, faculty, e-learning and IT staff	Applies Giddens' (1984) structuration theory to analyse change levers, identified as using a collaborative, participatory approach, creating social networks for potential adopters to learn from peers, combining mass and interpersonal communication, endorsing bottom-up engagement, recognising cultural differences between faculties and departments.
Spackman et al. (2015). What Can the Business World Teach Us About Strategic Planning. *Online Journal of Distance Learning Administration*, *18*(2).	USA / single HEI, administrators / authoethnography	Demonstrates that the Balanced Scorecard (BSC), widely used in the business world but still largely unknown to the distance and continuing education community, can help the latter face the challenges of increasing government regulation and accreditation, competition and accountability in a context of declining funding. However, the BSC methodology requires understanding and support on the part of senior administrators.
Stoddart (2015). Using educational technology as an institutional teaching and learning improvement strategy? *Journal of Higher Education Policy and Management*, *37*(5), 586–596.	Australia / single HEI / case study	Explores how educational technology can be used to drive institutional-level learning and teaching strategy. Concludes that although change was measurable, it did not occur at a systemic level, and identifies the need for take-up and mobilisation of the affordances of technology in order to impact teaching and learning. Also identifies the decisive role of human factors in the success or failure of a particular educational strategy, and focuses on inflection points or levers such as collaborative rather than individual approaches.

Table 2 Results: Empirical studies *(Continued)*

Empirical studies 2013-2017	Location / population / methodology	Findings
Tay and Low (2017). Digitalization of learning resources in a HEI – a lean management perspective. *International Journal of Productivity and Performance Management*, *66*(5), 680–694.	Singapore / 1 HEI / qualitative exploratory case study	Identifies key factors from a lean management perspective for the conversion of print-based materials to e-learning resources: common vision, top management support, timely information sharing, relationship management.
Trevitt et al. (2017). Leading entrepreneurial e-learning development in legal education: A longitudinal case study of "universities as learning organisations." *The Learning Organization*, *24*(5), 298–311.	Australia / 1 HEI / longitudinal case study, interviews and reflective analysis	Examines learning organisation attributes in the context of introducing distance learning within a research-intensive HEI. Analyses from the point of view of the iron triangle (cost-access-quality). Finds that entrepreneurialism resulted in growth (150 -> 2000 students over 15 years, 2 new programmes). Concludes that organisational learning in HE takes time (decades). Keys to success: business logic and internal networking.
Zhu (2015). Organisational culture and technology-enhanced innovation in higher education. *Technology, Pedagogy and Education*, *24*(1), 65–79.	China / 684 teachers from six universities / quantitative survey	Studies seven dimensions of organisational culture: goal orientation, participative decision making, innovation orientation, structured leadership, supportive leadership, shared vision and formal relationships with respect to e-learning and computer-supported collaborative learning. Results indicate the importance of goal orientation, innovation orientation, formal relationship among members and structured leadership.
Zhu and Engels (2014). Organizational culture and instructional innovations in higher education. *Educational Management Administration & Leadership*, *42*(1), 136–158.	China / 6 HEIs (186 teachers and 865 students)/ quantitative survey	Examines teachers' and students' perceptions of organisational culture together with opinions about teaching and learning innovations (student-centred learning, collaborative learning, use of educational technologies). Highlights the importance of an innovative, open and supportive organizational culture, clear goals, collaborative spirit and shared vision. Most influential organisational culture dimensions: goal orientation and collegial relationship.

Table 3 Results: Theoretical analyses

Theoretical analyses 2013-2017	Location and/or context / method	Approach / theories covered / arguments
Boyd and Sampson (2016). Foundation versus innovation: developing creative education practitioner confidence in the complex blended learning landscape. *Professional Development in Education*, *42*(3), 502–506.	UK / two arts institutions, reflection	Reflects on initiatives aimed toward developing staff digital confidence. Key to these initiatives is the issue of engaging practitioners with the importance of sound pedagogical design whilst developing familiarity with appropriate forms of technology.
Brown et al. (2016). *Curriculum for Digital Education Leadership: A Concept Paper. Commonwealth of Learning.*	Commonwealth / Concept paper	Introduces challenges faced in terms of digital education leadership. Presents conceptions of digital literacy, digital education and digital education leadership and motivations for the conceptualisation of a proposed curriculum framework for digital education leadership. Argues for Digital Education Leadership as a concept rather than e-leadership.
Gupton (2014). Online Frontiers in Education: Leadership's Role. *International Journal of Arts & Sciences*, *7*(2), 609–616.	Reviews research on Quality and Leadership of Online Education	Examines the crisis of leadership in HE in times of great change and the need for leadership as the online delivery of education develops. [NB. Uses emotional and value-laden language.]
Khanna (2017). A conceptual framework for achieving good governance at open and distance learning institutions. *Open Learning: The Journal of Open, Distance and E-Learning*, *32*(1), 21–35.	Proposes a good governance framework for ODL institutions	Based on 7 basic principles for ODL institutions: performance, transparency, accountability, participation, leadership, consensus orientation, fairness. Leadership considered from the perspective of direction and strategic vision.
Markova (2014). A Model of Leadership in Integrating Educational Technology in Higher Education. *Online Journal of Distance Learning Administration*, *17*(4).	Literature review on Educational Technology and Instructional Design, Leadership, Faculty Development, faculty attitudes to educational technology	Proposes a model of TEL leadership in HE and considers the impact educational technologies have on instruction itself and why many faculty members view the technology as being too difficult to apply to existing technology infrastructure. Model not applied.
McCutcheon (2014). A Leadership Framework to Support the use of E-Learning Resources. *Nursing Management*, *21*(3), 24–28.	Application of NHS nursing leadership framework to e-learning for postgraduate nursing education	Proposes the application of the NHS nursing leadership framework to structure and guide the process of e-learning development. Frame work organised into 7 dimensions around the central aim of delivering the service: demonstrating personal qualities, working with others, managing services, improving services, setting direction, creating the vision, delivering the strategy.
Mishra et al. (2016). E-Leadership and Teacher Development using ICT. In R. Huang & J. K. Price (Eds.), *ICT in Education in Global Context* (pp. 248–266). Berlin, Heidelberg, DE: Springer-Verlag.	Analysis of e-leadership in business, applied to education (schools)	Takes e-leadership as understood in the business context and relates it to the field of education, using the RAT (Replace, Amplify, Transform) framework (Hughes, Thomas, & Scharber, 2006).
Mukerjee (2014). Agility: a crucial capability for universities in times of disruptive change and innovation. *Australian Universities' Review*, *56*(1), 56–60.	Australia / organisational agility	Explores the concept of agility as applied to HE institutions: in terms of strategic, business, cultural, customer and partnering agility. Concludes the need to break down silos, to foster both organisational and individual agility and to ensure

Table 3 Results: Theoretical analyses *(Continued)*

Theoretical analyses 2013-2017	Location and/or context / method	Approach / theories covered / arguments
		IT departments take a central strategic role.
Murphy (2016). The future of Technology Enhanced Learning (TEL) is in the hands of the anonymous, grey non-descript mid-level professional manager. *Irish Journal of Technology Enhanced Learning*, *2*(1), 1–9.	Ireland / discussion paper as an aside to a literature review, part of a doctoral thesis looking at the management of blended learning courses in HE	Reflects on the changing role of the academic in a new managerialist TEL HE sector and argues for the recognition of the i mportance of the mid-level professional manager in transitioning bottom-up to institute-wide TEL initiatives.
Orr and Cleveland-Innes (2015). Appreciative leadership: Supporting education innovation. *International Review of Research in Open and Distributed Learning*, *16*(4), 235–241.	Application of Appreciative Inquiry to educational leadership	Suggests that appreciative leadership can support innovation by rejecting problem-based and deficit models in favour of freeing staff to generate new and innovative solutions, mobilising organisational member participation as a co-constructor of present and future possibilities. Refers to K12 context, but has potential for application in HE.
Phelps (2014). "So much technology, so little talent"? Skills for harnessing technology for leadership outcomes. *Journal of Leadership Studies*, *8*(2), 51–56.	Literature review, focus = leadership educators	Reviews the literature on e-leadership and technology-centred fields, and provides recommendations and implications for leading in online environments.
Salmon and Angood (2013). Sleeping with the enemy. *British Journal of Educational Technology*, *44*(6), 916–925.	Australia, joint reflection from a Pro Vice-Chancellor of Learning Transformations and an IT director	Explores the reasons for conflict between IT and faculty and formulates 16 (actually 15) recommendations for constructive collaboration leading to organizational changes, grouped into three strategic themes: Behavioural, Organisational, Facilitation.
Sutton and DeSantis (2017). Beyond change blindness: embracing the technology revolution in higher education. *Innovations in Education and Teaching International*, *54*(3), 223–228.	Theoretical analysis – diffusion, tech acceptance, TPACK	Explores three foundational educational technology theories: Rogers' (1962, 2003) diffusion model, Davis' (1989) technology acceptance model and Mishra and Koehler's (2006) technological, pedagogical and content knowledge (TPACK) model. Recommends that HE leadership integrate implications of these in design of Continuous Professional Development.
Tintoré and Arbós (2013). Identifying the stage of growth in the organisational learning capacity of universities. *Universities and Knowledge Society Journal (RUSC)*, *10*, *No 2*(2013), 375–393.	Analysis of existing questionnaires, final version validated by 8 experts	Proposes a tool (Organisational Capacity Model questionnaire) for identifying the stage of growth in the organisational learning capacity of a university. Covers individual learning, institutional learning (teamwork, leadership and vision, culture and values, structures, resources, openness to the environment, barriers to learning). Tool not applied.
Van Wart et al. (2017). Integrating ICT adoption issues into (e-)leadership theory. *Telematics and Informatics*, *34*(5), 527–537.	Analysis of different related fields of research to propose integrated framework	Studies ICT adoption through the lens of technology adoption literature, enterprise resource planning literature and leadership change management. Widens the

Table 3 Results: Theoretical analyses *(Continued)*

Theoretical analyses 2013-2017	Location and/or context / method	Approach / theories covered / arguments
		notion of e-leadership from leading in virtual environments to that of choosing, recommending and sup porting the implementation of ICT in organisations.

Table 4 Results: Opinion pieces

Opinion pieces 2013-2017	Location (if relevant) / method	Approach / theories covered / arguments
Beaudoin (2016). Issues in Distance Education: A Primer for Higher Education Decision Makers. *New Directions for Higher Education*, (173), 9–19.	Opinion piece, exploring distance education issues in HE from a leadership point of view	Presents an overview of current issues related to distance learning in HE. Identifies central questions, issues, challenges and opportunities to be addressed by decision makers, as well as 15 key attributes of effective leaders.
Brown (2014). Reenvisioning Teaching and Learning: Opportunities for Campus IT. *Libraries and the Academy*, *14*(3), 383–391.	Opinion piece, IT et educational technology	Explores the role of IT departments in relation to educational technology and argues for IT to play a strategic role in the development of teaching and learning innovation, implying rethinking the roles of the chief information officer (CIO) and the academic technologist.
Chow (2013). One Educational Technology Colleague's Journey from Dotcom Leadership to University E-Learning Systems Leadership: Merging Design Principles, Systemic Change and Leadership Thinking. *TechTrends*, *57*(5), 64–75.	Opinion piece, personal reflexion on attempts to bring about change as a learning technology leader	Concludes the need to develop systems thinking and to focus on the human aspects, bringing stakeholders together to discuss issues and find solutions. Proposes an e-learning systems change model around ends, means and processes. Main issues: define the vision and assess whether support unit has the appropriate competences.
Moccia (2016). Managing Educational Reforms during Times of Transition: The Role of Leadership. *Higher Education for the Future*, *3*(1), 26–37.	Opinion piece based on personal experience as HE leader	Presents a strategy summarised in six points to help HE leaders reinvent their industry: be global, financially sustainable, value-added, technological-oriented, a strategic local partner, substance more im portant than form.
Persichitte (2013). Leadership for Educational Technology Contexts in Tumultuous Higher Education Seas. *TechTrends*, *57*(5), 14–17.	Opinion piece based on personal experience and some theoretical references. Guiding principles for educational technology leadership	Importance of history and legacy, knowing when to lead from the front and from behind, using iterative data collection for shared problem-solving, awareness of policy and politics, horizon scanning, taking calculated risks, being prepared to take the hard decisions.
Watson and Watson (2013). Exploding the Ivory Tower: Systemic Change for Higher Education. *Tech Trends*, *57*(5), 42–46.	Opinion piece, educational technologists as change agents	Argues for the need for the systemic change of higher education and presents educational technologists as particularly well placed to lead this change.

Empirical studies 2013-2017

In terms of location, the spread across geographical regions was reasonably equitable, as shown in Table 5 below:

It should be noted that four of the six European studies were located in the UK and one other covered three European countries (Finland, Spain and the Czech Republic) as part of an ERASMUS+ project.

Turning now to populations, three main clusters of focus were identified:

1) governance and senior leaders: 9 results,
2) non-governance stakeholders (teachers, teachers and students, instructional designers): 8 results,
3) holistic multi-stakeholder approaches at different levels (project, faculty, single institution, multiple institution): 10 results.

Cluster 1 consists of studies focussed on leadership from the perspective of formal leaders: faculty governance (Ciabocchi, Ginsberg, & Picciano, 2016), university administrators (Livingstone, 2015; Spackman, Thorup, & Howell, 2015), senior leaders (Akcil, Aksal, Mukhametzyanova, & Gazi, 2017; Holt, Palmer, Gosper, Sankey, & Allan, 2015), online education administrators (Burnette, 2015) or through the mobilisation of local and international experts (Davis & Higgins, 2015; Díaz & Báez, 2015).

Cluster 2 results studied leadership from the perspective of stakeholders who are not themselves in TEL leadership roles: change management from teachers' perspective (Sheiladevi & Rahman, 2016); teachers' perceptions of organisational culture (Zhu, 2015), related to a previous study involving both teachers and students (Zhu & Engels, 2014); futures visioning with deans and lecturers (Inayatullah & Milojevic, 2014); instructional designers and e-learning production staff (Ashbaugh, 2013; Tay & Low, 2017) students' perceptions of leadership in online instructors (Bogler, Caspi, & Roccas, 2013).

Cluster 3 studies took a holistic multi-stakeholder approach at project-level (Brown, 2013; Garrison & Vaughan, 2013; Stoddart, 2015), faculty or department level (King & Boyatt, 2015; Trevitt, Steed, Du Moulin, & Foley, 2017) or institution-wide, with one focussing on a single institution (Roushan, Holley, & Biggins, 2016) and four taking a multiple-institution approach (Cifuentes & Vanderlinde, 2015; Domingo-Coscollola, Arrazola-Carballo, & Sancho-Gil, 2016; Ng'ambi & Bozalek, 2013; Singh & Hardaker, 2017).

A variety of methodologies were also mobilised:

– 16 qualitative studies, taking different approaches such as semi-structured interviews, action research, phenomenology, community of inquiry and narrative inquiry;

Table 5 Empirical studies by geographical region

Region	Number of studies
North America	5
Central and South America	3
Africa and Middle East	3
Asia	5
Australasia	4
Europe	6

– 9 quantitative studies;
– 2 mixed methods approaches.

Five of the qualitative approaches were presented as case studies, as was one of the mixed methods studies. It should be noted here that the latter (Livingstone, 2015) relied solely on an online survey and included personal criticism of the institution with value-laden language. A further case study (Brown, 2013) makes no explicit reference to the methodology used and it was not possible to determine this from a detailed reading of the article.

If we now compare the methodologies used to the populations studied, we find that nine of the ten holistic multi-stakeholder approaches used or included qualitative methods (Table 6).

Finally, taking into account Jameson's observation of a lack of dialogue between the two fields of education technology research and education management research, it is worth looking at the type of journal in which these empirical studies have been published:

– 15 studies were published in education technology journals,
– 6 studies were published in education management journals.

The remaining studies were distributed among journals focusing on science and technology education (3), media education (1), education and teaching (1), productivity and performance (1).

Interestingly, one of the studies by Zhu (Zhu & Engels, 2014) was published in an education management journal, the other (Zhu, 2015) in an education technology journal, perhaps showing the will to bridge this divide between the two fields.

Theoretical analyses 2013-2017

Three of the results provide an analysis of leadership theories in relation to the integration of technology for teaching and learning, taking e-leadership as understood in

Table 6 methodologies and research design by population scope (holistic studies)

Scope	Number	Methodology	Research design	Reference
Multi-institution	5	MMR	semi-structured interviews, focus groups, document analysis, survey (n=348)	(Cifuentes & Vanderlinde, 2015)
		QUANT	online survey, (n=259)	(Ng'ambi & Bozalek, 2013)
		QUAL	Document analysis, focus groups	(Domingo-Coscollola et al., 2016)
		QUAL	Multiple case studies	(Brown, 2013)
		QUAL	Exploratory case studies	(Singh & Hardaker, 2017)
Single institution	1	QUAL	Action research	(Roushan et al., 2016)
Faculty level	2	QUAL	Phenomenology: focus groups, individual interviews	(King & Boyatt, 2015)
		QUAL	Interviews	(Trevitt et al., 2017)
Project level	2	QUAL	practical inquiry and community of inquiry	(Garrison & Vaughan, 2013)
		QUAL	case study	(Stoddart, 2015)

business and relating it to the field of education (Mishra, Henriksen, Boltz, & Richardson, 2016), or developing a model of TEL leadership (Markova, 2014).

Others focus on the acceptance of technology by HE teaching staff with recommendations for HE leadership to integrate the implications of different models of technology acceptance (Rogers' (1962, 2003) diffusion model, Davis' (1989) technology acceptance model and Mishra and Koehler's (2006) technological, pedagogical and content knowledge TPACK model) in Continuous Professional Development (Sutton & DeSantis, 2017).

In particular Van Wart, Roman, Wang, and Liu (2017) propose widening the notion of e-leadership from leading in virtual spaces to include the act of choosing, recommending and supporting the implementation of ICT for an organisation, and propose a framework for connecting the different literatures in the fields of e-leadership and technology adoption.

Boyd and Sampson (2016) reflect on initiatives aimed toward developing staff digital confidence, an approach which is also found in Brown et al. (2016), who present conceptions of digital literacy and digital education as motivations for the conceptualisation of a proposed curriculum framework for digital education leadership.

Of significant interest is the approach proposed by McCutcheon (2014). This entails applying the UK National Health Service (NHS) Nursing Leadership Framework to structure and guide the process of developing e-learning for postgraduate nursing education. This framework is organised into seven dimensions around the central aim of delivering the service: demonstrating personal qualities, working with others, managing services, improving services, setting direction, creating the vision, delivering the strategy.

In reviewing research on Quality and Leadership of Online Education, Gupton (2014) examines the need for leadership as the online delivery of education develops, but uses emotional and value-laden language. Mukerjee (2014) explores the concept of organisational agility, while Murphy (2016) formulates an argument for the recognition of the importance of the mid-level professional manager in transitioning bottom-up to institute-wide TEL initiatives.

Finally, in the field of Organisational Learning, Tintoré and Arbós (2013) propose an Organisational Capacity Model questionnaire for identifying the stage of growth in the organisational learning capacity of a university, covering individual learning and institutional learning (teamwork, leadership and vision, culture and values, structures, resources, openness to the environment, barriers to learning). As with Khanna's (2017) good governance framework, Díaz and Báez's (2015) instrument for exploring leadership capabilities for ICT in education, Markova's (2014) TEL leadership model and Jameson's (2013) e-leadership framework for TEL, no evidence of the application of this tool in empirical studies has been identified.

Opinion pieces 2013-2017

The six opinion pieces identified in the literature view are presented briefly here to provide a picture of the preoccupations of HE leaders and other stakeholders who are taking an interest in the question of leadership for TEL in HE. Beaudoin (2016) presents an overview of current issues related to distance learning in HE, identifying central questions, issues, challenges and opportunities to be addressed by decision makers, as

well as key attributes of effective leaders, which can be classified as leadership style and vision (transformational, change-management rather than technology as the priority, tolerance for ambiguity and risk); critical (assessment of situations, using data, resisting fashion, focus on both micro and macro perspectives); pedagogical (sound knowledge of distance education and theory, advocacy, decide and act as learner-centered educator); networking (to share ideas, strategies and resources).

Based on personal experience as an HE leader, Moccia (2016) presents a six-point strategy to help HE leaders reinvent their industry: be global, financially sustainable, value-added, technological-oriented, a strategic local partner, substance more important than form. Similarly, Persichitte (2013) builds on personal experience to present TEL leadership recommendations terms of context, behaviours and skills. Chow (2013) gives a detailed and honest account of the adaptation necessary in his move from Dotcom leadership to a HE environment, in particular the need to develop systems thinking and to focus on the human aspects, bringing stakeholders together to discuss issues and find solutions.

From the Information Technology (IT) perspective, Brown (2014) argues for IT departments to play a strategic role in the development of teaching and learning innovation, implying rethinking the roles of the chief information officer (CIO) and the academic technologist, the latter group also being reflected in Watson and Watson's (2013) argument for educational technologists to be seen as key change agents.

Leadership theories

While the purpose of this paper is not to provide a comprehensive review of leadership theory itself, it is still important to look more closely at which leadership theories and concepts are being referred to in the results identified in this literature review. As can be seen from the graph below (Fig. 4) the main theories cited are transformational leadership, distributed leadership and e-leadership.

Stewart (2006) provides a detailed account of the evolutions in transformational leadership theory, tracing it back to its origins in the seminal work of Burns (1978) who identified two types of leadership: transactional and transformational. While transactional leadership involves the leader exchanging something of value with the follower, transformational leadership "looks for potential motives in followers, seeks to satisfy higher needs, and engages the full person of the follower" (Burns, 1978, p. 4). In this case there is a search for mutually beneficial solutions with an increase in commitment and capacity to achieve mutual purposes.

Transactional and transformational leadership are not necessarily diametrically opposed, as can be seen in the development of Full Range Leadership Theory or FRLT (Bass & Avolio, 1997) where leaders mobilise a variety of behaviours in order to obtain greater commitment from followers.

Distributed leadership theory first emerged as a concept in the mid 1950s (Gibb, 1954) and a significant body of work on distributed leadership of educational organisations has been developed since the beginning of the 2000s (Bolden, 2011; Bolden, Gosling, & Petrov, 2009; Gronn, 2002, 2008; Harris, 2008; Harris & Spillane, 2008; Spillane, 2012; Spillane, Halverson, & Diamond, 2004). However, as Tian, Risku, and Collin (2016) point out, there is no universal accepted definition, proposing that "distributed leadership be defined and studied in terms of leadership as a process that

comprises both organisational and individual scopes; the former regards leadership as a resource and the latter as an agency. Both resource and agency are considered to emerge and exist at all organisational levels." (Tian et al., 2016, p. 158).

As mentioned in the introduction to this study, e-leadership theory refers to "a social influence process embedded in both proximal and distal contexts mediated by AIT that can produce a change in attitudes, feelings, thinking, behavior, and performance" (Avolio et al., 2014). The different understandings of e-leadership in relation to TEL are discussed later in this article.

The results also cite other concepts associated with leadership which are not necessarily theories in their own right: top-down, bottom-up, middle-out, formal, informal, structured, supportive, passive (the latter coming under the umbrella of FRLT).

The following chart (Fig. 4) shows the frequency of occurrence of each of these theories and concepts according to the type of result.

It should be noted here that the 'distributed' label also encompasses other terms, such as 'distributive', 'collaborative', participatory', 'participative' and that these concepts may not necessarily always refer to the same theory or understanding. Furthermore, the concepts of supportive and structured leadership were only used in two articles relating to the Chinese context (Zhu, 2015; Zhu & Engels, 2014). Finally, several articles, including empirical studies, make no mention of the underlying leadership theory, as is the case of Garrison and Vaughan (2013), despite references to both collaborative and distributed leadership, and of Watson and Watson (2013), who refer to universities as complex systems yet do not make any reference to complexity leadership theory (Arena & Uhl-Bien, 2016; Clarke, 2013; Hazy & Uhl-Bien, 2015; Uhl-Bien, Marion, & McKelvey, 2007).

Other theories not directly related to the field of leadership are used to shed light on the question. In particular Singh and Hardaker (2017) apply Giddens' (1984) Theory of Structuration to identify a set of change levers at the intersection of bottom-up and top-down initiatives, namely the promotion of a collaborative, participatory approach,

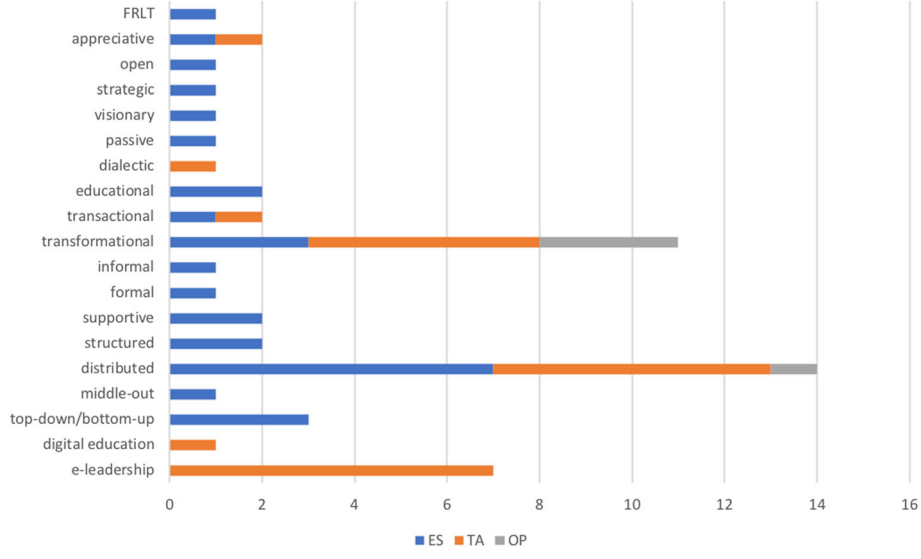

Fig. 4 Number of results per category 2013-2017 citing a particular leadership theory or concept

helping to form social networks so that potential adopters learn from peers, combining mass and interpersonal communication, endorsing bottom-up engagement and recognising the cultural specificity of faculties and departments.

Van Wart et al. (2017) and Sutton and DeSantis (2017) draw on the technology adoption literature, while Ng'ambi and Bozalek (2013) refer to Rogers' diffusion of innovation theory (Rogers, 2003; Rogers & Scott, 1997). Brown (2013) and Shieladevi and Rahman (2016) take a change management perspective. Other theories taken from the management field include learning organisations (Trevitt et al., 2017) and lean management (Tay & Low, 2017).

Perhaps the most significant observation here is that none of the empirical studies actually refer explicitly to e-leadership. We can thus conclude that there is a distinct lack of empirical research in e-leadership for TEL in HE. In those results which did cite e-leadership, the most widely used theories associated with e-leadership were again distributed and transformational, as can be seen in Fig. 5 below.

Discussion

This exploratory literature review was conducted in order to determine the extent to which the concept of e-leadership has taken off a lens through which to study leadership for technology-enhanced learning in higher education. Both the prevalence and the relevance of the use of this concept are discussed below. Trends are identified with respect to Jameson's (2013) e-leadership framework for TEL. Finally, recommendations for further research are formulated to bridge the gaps identified by the interrelated secondary research questions of populations studied, methodologies applied and levels of analysis, as well as in terms of (inter)disciplinarity.

(Re-)defining e-leadership

As we have already noted, none of the empirical studies identified in the search actually cite e-leadership, although there is a certain amount of interest among the theoretical papers. We might conclude that e-leadership for technology-enhanced learning in higher education has not taken off as a field of research, but before jumping to such a conclusion it is worth taking a closer look at the concept of e-leadership itself. If we

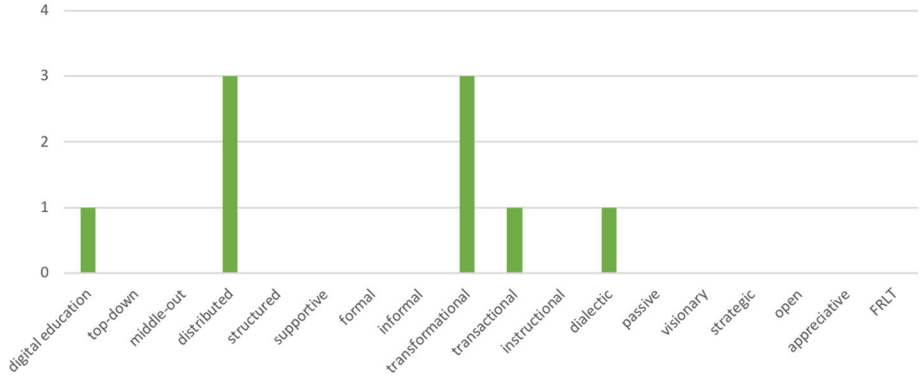

Fig. 5 Other theories or concepts cited alongside e-leadership

take the strict definition of e-leadership as referring to "a social influence process embedded in both proximal and distal contexts mediated by AIT that can produce a change in attitudes, feelings, thinking, behavior, and performance" (Avolio et al., 2014) and then unpack it, we can see that one of the elements in particular, the notion of 'social influence processes… mediated by AIT', might not always be present in the leadership relationships we are studying.

We can take the teaching and learning process to be mediated by AIT in TEL, and therefore see that the application of e-leadership theory is relevant to the topic of leading in online environments (Phelps, 2014). However, the leadership interventions, behaviours and attitudes of higher education governance and academic leaders in strategic thinking and decision-making around TEL are themselves not necessarily mediated by technology, although they may be. One perspective which shows promise in this respect is that put forward by Van Wart et al. (2017), of bringing together the literatures on e-leadership and technology adoption within the following wider definition of e-leadership as "the ability to effectively select and use ICTs for both personal and organizational purposes" (Van Wart et al., 2017, p. 529). While the focus here is on ICT adoption from a general organisation perspective, the further application of this approach to TEL in a higher educational setting is a logical next step, resonating with another educational leadership definition of e-leadership, namely as "the effective promotion and integration of technological learning and literacy into and within [educational] environments" (Preston et al., 2015, p. 991).

In analysing online education administrators' struggles for authority in the higher education landscape, Burnette (2015) quotes Beaudoin's (2002) definition of distance education leadership, namely as "a set of attitudes and behaviors that create conditions for innovative change, that enable individuals and organizations to share a vision and move in its direction, and that contribute to the management and operationalization of ideas" (Beaudoin, 2002, p. 132). This definition could in fact apply to leadership for change in general, although certain components of it are reflected in the some of the main trends identified in the present study (see also Fig. 6 below), in particular e-leadership visioning, change management and strategic planning.

Some authors accept the concept of e-leadership as multifaceted and conceptually ambiguous (Gurr, 2004; Salmon & Angood, 2013). Others go further, proposing a new concept of 'Digital Education Leadership' to mark the shift in focus from emphasising leadership in educational technology to "the fostering of leaders who have the qualities to lead in a digital culture" (Brown et al., 2016, p. 8) where "Digital education leadership is concerned with providing direction in terms of digital education by enhancing access, capacitating peers, making informed decisions and cultivating innovation, to achieve the learning goal (digital literacy)." (Brown et al., 2016, p. 10). However, as can be expected with the introduction of a new concept, a search in the three main databases (ISI Web of Science, Scopus and ERIC) for peer-reviewed papers using the search terms "Digital Education Leadership" AND "Higher Education" produced no results. This would thus not have been useful for our literature review at this stage, but should be included in future searches alongside the combinations already used.

Trends

Looking back at some of the major themes emerging from Jameson's 2013 study, we can see that the majority are still prevalent, to differing degrees. Comparisons of transformational versus transactional leadership are still present (3 results) although there is a clear development of studies focusing on distributed or shared leadership, with 26% of the empirical studies and 38% of the theoretical analyses referring to this concept.

Figure 6 below shows the number and distribution of occurrences of the main themes from Jameson's e-leadership framework, where these themes were present in 5 or more results.

Jameson's framework (Fig. 2) is structured around three major dimensions: Purpose, People and Structures & Social Systems. In the "Purpose" dimension, e-Leadership visioning, Strategic planning and Learning & Teaching are the three most cited themes among the results in this 2013-2017 study. For the "People" dimension, we find Collaboration and collegiality; Values, behaviour and culture; Interpersonal skills; Training and Continuous Professional Development (CPD). Finally, for the "Structures & Social Systems" dimension, the three most cited themes are Distributed leadership, Change management and Resource allocation.

Other emerging themes, over and above those covered in Jameson's framework, are identified as:

- the application of technology acceptance and adoption models (Akcil et al., 2017; Boyd & Sampson, 2016; King & Boyatt, 2015; Livingstone, 2015; Markova, 2014; Sutton & DeSantis, 2017; Van Wart et al., 2017);
- the application of tools and methods from the business world, as suggested by Sangrà (2009), with the caveat of the necessary cultural adaptation to HE (Chow, 2013; Mishra et al., 2016; Spackman et al., 2015; Tay & Low, 2017);
- using data for decision-making (Brown et al., 2016; Burnette, 2015; Persichitte, 2013);

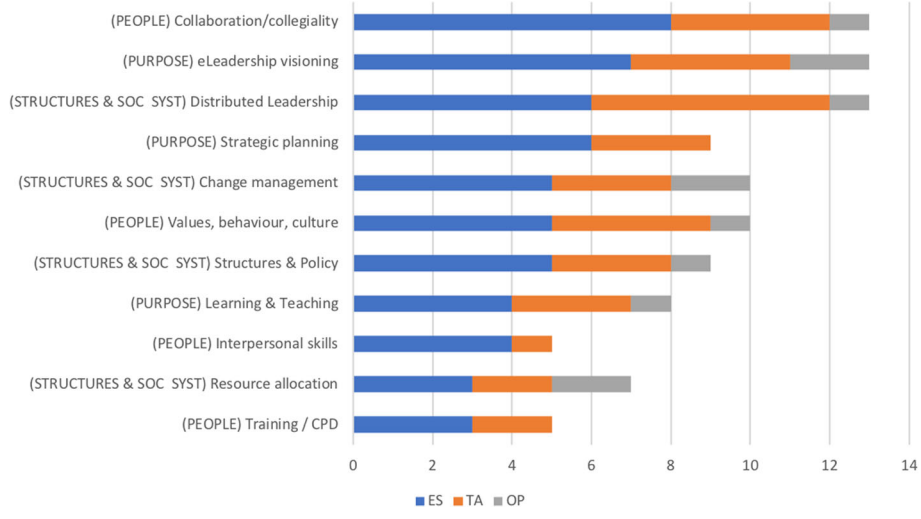

Fig. 6 Thematic analysis of results 2013-2017 compared to Jameson's (2013) e-Leadership framework

- studying TEL adoption from the point of view of organisational learning (Tintoré & Arbós, 2013; Trevitt et al., 2017);
- personal digital competence / literacy / confidence, of both leaders and staff (Akcil et al., 2017; Boyd & Sampson, 2016; Brown et al., 2016; Domingo-Coscollola et al., 2016).

Recommendations

This paper identifies four main gaps in the current research. These can be expressed in terms of populations studied, methodologies used, the disciplines to which these studies are related and the application of models and frameworks.

The first gap is defined as a lack of research at a holistic level, linking leadership to strategy and organisation. As Alvesson (2017) states: "Leadership is not a simple original source of much influencing, but needs to be placed in a broader context of hierarchical and vertical divisions of work, labour processes and cultural and material pressures from various interest groups" (Alvessson, 2017, p. 12). If we are looking to support HE leaders in developing strategic thinking, vision and action to improve the way technology is used for teaching and learning, then the focus of research needs to go beyond the analysis of leadership at project level, with more empirical studies addressing the question of leadership for TEL from a holistic, multi-stakeholder perspective at institutional level. The six results identified in this literature review would benefit from comparison with further studies taking such an approach to build up a much more comprehensive literature base.

Bridging the second gap involves employing robust research designs to take into account the complexity of such a holistic approach. Mixed Methods Research is particularly relevant for this as it "offers richer insights into the phenomenon being studied and allows the capture of information that might be missed by utilizing only one research design, enhances the body of knowledge, and generates more questions of interest for future studies that can handle a wider range of research questions." (Caruth, 2013). Furthermore, given the complex nature of leadership research, mixed methods enable the scholar to provide the most complete analysis, "extending beyond mere quantitative numbers or qualitative words" (Creswell & Plano Clark, 2011; Stentz, Plano Clark, & Matkin, 2012). Such an approach should also contribute to reducing researcher bias and avoid the limitation which Roushan et al. (2016) identify in their study, in that the researchers being themselves advocates of TEL may have meant that some opposition to change was under-reported.

The third gap concerns a distinct lack of interdisciplinary research. Given that this research takes place at the intersection of different disciplinary fields - education technology and management studies - insights from both fields are required. It is thus recommended that interdisciplinary teams collaborate on such research in order to reinforce synergies and ensure the best possible understanding of both worlds. In this respect, much can be learnt from the HE leadership and management literature, for example H. Davis' work on Leadership Literacies (Davis, 2012, 2014; Davis & Jones, 2014), and by continuing to develop the connections between leadership and change management for TEL (Martins & Baptista Nunes, 2016; Risquez & Moore, 2013). Further efforts to publish in education management journals should also be made, in order to increase

the awareness of issues relating to the integration of technology for teaching and learning at HE governance level.

The final gap concerns the need to test existing models and frameworks through application in empirical studies. As we have seen, a number of models have been developed, either through empirical or theoretical studies (Díaz & Báez, 2015; Jameson, 2013; Khanna, 2017; Markova, 2014; McCutcheon, 2014). It would thus appear timely to test the validity of these frameworks in the field, through case studies focusing on qualitative contextual data as well as quantitative analysis.

Specific research lines should thus be fostered at meso (institutional) level, focusing on values, strategy, organisation and leadership interactions, while at the same time taking into account macro factors such as the economy and public policy, as well as teaching and learning at the micro level. Attention should be paid to making explicit any underlying assumptions about TEL, on the part of both the researchers themselves and the populations being studied (Bayne, 2015). A further focus should be placed on studying leadership development with specific reference to TEL, exploring the learning ecologies (Esposito, Sangrà, & Maina, 2015) of HE leaders who are making decisions about technology for teaching and learning. In other words, what formal and informal learning do they engage in and what influences their world views with respect to the changing technology landscape and its impact on teaching and learning? Related to this, studies could focus specifically on the relationships between HE leaders' own (critical) digital literacies (Belshaw, 2014), their awareness of the affordances of technology for teaching and learning, and their leadership attitudes and behaviour with respect to TEL.

Conclusion

Given the relative paucity of empirical results in this update of Jameson's 2013 literature review, at a time when HE leaders still need to develop their capacity for strategic thinking with respect to the integration of technology for learning and teaching, we conclude that further research into (e-)leadership for TEL in higher education would be welcome, just as Jameson herself did. The question of how we define e-leadership also needs to be addressed. Rather than hide behind arguments of conceptual ambiguity, it would be preferable for scholars in the field to draw on emerging proposals for including decision-making for TEL adoption at organisational level in the definition or to place e-leadership firmly within the original scope of leading in virtual environments and to adopt another concept such as that of "Digital Education Leadership".

There are of course limitations to this study in that it is intended as an update to that carried out by Jameson and thus covers a relatively short period (2013-2017). Further regular searches will be carried out, including citation analysis.

Finally, we argue for more collaboration between the disciplinary fields of educational technology and educational management. The sun may not yet have fully dawned on e-leadership as the 5th age of educational technology research in higher education, but there is both the potential and the need for this age to emerge at the intersection of these disciplines.

Abbreviations

AIT: Advanced information technology; CIO: Chief Information officer; CPD: Continuous professional development; ES: Empirical studies; FRLT: Full range leadership theory; HE: Higher education; ICT: Information and communication technology; IT: Information technology; MMR: Mixed methods research; NHS: National health system (UK); ODL: Open

and distance learning; OP: Opinion pieces; QUAL: Qualitative research; QUAN: Quantitative research; TA: Theoretical analyses; TEL: Technology-enhanced learning; TPACK: Technological, pedagogical and content knowledge

Authors' contributions
This is a fully co-authored paper. Both authors read and approved the final manuscript.

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