Operationalizing the definition of e-leadership: identifying the elements of e-leadership

Montgomery Van Wart
Professor, California State University San Bernardino, USA

Alexandru Roman
Associate Professor, California State University San Bernardino, USA

XiaoHu Wang
Professor, City University, Hong Kong, China

Cheol Liu
Assistant Professor, KDI School of Public Policy and Management, Sejong, South Korea

Abstract
The effects of the ongoing digital revolution have been profound and have been studied in many contexts such as government interaction with the public (e-participation) and administrative structures (e-administration). However, the study of how the digital revolution has changed leaders' interactions with followers via information and communication technologies (ICTs) has been modest, and the theory building in organizational studies and public administration has been, for the most part, nonexistent. A major reason for this lack of progress is the inability to produce an operational definition of e-leadership that spans telework, team, and enterprise settings. The article examines an exploratory case study to propose an operational definition based on six factors (or broad e-competencies) for e-leadership. Research limitations and future research opportunities are discussed.

Points for practitioners

- E-leadership, technology-mediated leadership, has become critically important for leaders at all levels, both inside and outside of the organization.

Corresponding author:
Montgomery Van Wart, PhD, Professor, California State University San Bernardino, 5500 University Parkway, San Bernardino, CA 92506, USA.
Email: mvanwart@csusb.edu

- E-leadership is as much about blending technologies and traditional communication as it is about simply using more ICT-mediated communication.
- While there is a lot of consistency in the types of leadership skills needed in traditional and virtual environments, they are not the same and the differences are critical to success and failure.
- The areas in which competence in e-skills were most important included: e-communication, e-social skills, e-team building, e-change management, e-technology skills, and e-trustworthiness.

The effects of the ongoing digital revolution, leading to the age of information in which we now live, has been well documented in terms of technology and people (e.g. Grossman and Vella, 2014; Hilbert and Lopez, 2011; Yong and Gates, 2014). Studies of the effects on governments have been plentiful in examining government–citizen interactions via websites, social media, services delivered through the internet, and so on (e.g. Allen and Seaman, 2015; Holzer et al., 2014; Norris and Moon, 2005). So, too, has the study of the effects of administrative operations and structures (Moon et al., 2014). Not only are these topics addressed in mainstream public administration journals, but at least half a dozen new journals have emerged that focus specifically on information and technology. However, the discussion of how leadership has been affected by the digital revolution in administrative settings has been curiously absent. There are at least three major reasons why electronically mediated leadership—e-leadership—is important to understand and study.

First, skills in various types of communications are normally ranked at the top of leadership lists in public agencies (see Van Wart, 2011: 294–295), with oral communication often first. Therefore, the revolution in communications that has continued to intensify as new technologies merge and children are raised with complex technology from birth is of enormous impact to leaders. One effect of the communication revolution has been the proliferation of new communication tools from which to choose, the ease of communication, and the challenge of communication overload and the "constant contact" (Avolio et al., 2014).

A second reason for the importance of e-leadership is the change in organizational patterns facilitated by the digital revolution. The rise of teams, telework, and distributed leadership patterns relies heavily on expedited electronic communication which leaders must master, manage, and coordinate. So important are ICT-mediated methods to new management forms that they are frequently called "collaboration tools" (Anthopoulos et al., 2007).

A third reason for the importance of e-leadership is the change in management, and thus leadership, itself. The technical requirements have increased at all levels for leaders who are expected to be competent with new information and

communication technologies (Groysberg, 2014). To date, the merger of various technologies has not made this significantly easier, with technological expectations continuing to increase (Yong and Gates, 2014).

Avolio et al. (2000: 615), in their seminal article on e-leadership, stated that "past leadership research has not focused on issues confronting the leadership in organizations where work is mediated by AIT [Advanced Information Technology]". And further, "it is perhaps too early to identify any empirically based, systematic, patterned variations or to draw any broad conclusions about e-leadership" (2000: 616). No mid- or macro-level theories had emerged to assemble the numerous micro-level studies conducted. In a reassessment of the literature 14 years later, Avolio et al. state that the study of e-leadership remains at "very nascent stages of development" (2014: 105) and has continued to lag behind its practice substantially, and they suggest that it has actually *widened* in recent years: "advances in AIT and its appropriation at all levels of organizations and societies have far outpaced the practice and science of leadership" (2014: 106).

What about the public sector context? There has been considerable mid- and macro-level theorizing about e-government and e-governance, especially using normative principles stemming from democratic theory (e.g. Bannister and Connolly, 2011; Meijer, 2015). However, there have been few studies on e-leadership in the public sector even using a broad definition of e-leadership, and it becomes a handful if one narrows the focus to the administrative (public sector organizational), as opposed to the political, context. Although there are many reasons, one of the most fundamental is the definition and conceptual confusion. Until some operational definitions are proposed and then tested, little or no theoretical work of consequence is likely.

The purpose of this article is to begin to fill this void in the literature. First, the article discusses the current broad theoretical definition of e-leadership and suggests a more concrete one for research purposes. Second, the article provides a case study to identify the critical elements of e-leadership in a single setting. Third, the article discusses the similarities and dissimilarities of the case study with the literature. The combined analysis leads to a list of 15 discrete elements that we propose can be combined into six factors or competencies. This is followed by seven overall propositions based on the factors identified, and that can be tested and refined. Study limitations and a short discussion of the general implications of this work conclude the article.

Defining e-leadership in more concrete terms

The most current and commonly accepted definition of e-leadership by researchers is: "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: 107). This definition, suitable at an abstract level, emphasizes the effects of the use or non-use of information and communication technologies (ICTs, the term that will be used in this article in line with the field). The de facto alternative style is "traditional" leadership,

which is leadership mediated by face-to-face communication (speaking and listening) with its rich nonverbal communication and physical presence cues, as well as physical and "low-tech" dissemination of materials. The ease of communication via ICTs over traditional physical dissemination has had a particularly large influence on the expansion of written methods, not only replacing traditional dissemination of memoranda, guidelines, etc., but frequently substituting for meetings (e.g. listservs and file-sharing) and traditional phone messages (e.g. texting) (Feeney and Welch, 2012). However, moving from the highly abstract definition provided by Avolio et al. (2014) to a more concrete definition that can be used in theory testing and applied settings has several challenges.

First, since leaders must use and blend *both* traditional and electronic styles in a variety of situations for differing purposes, a definition solely focused on the use or nonuse of ICTs may not be useful for all purposes. While leaders may have some simple dichotomous decisions about using traditional versus e-methods, just as frequently strategies are about the ideal blending of communication methods, which create a variety of hybrid traditional-virtual categories, such as when an initiative is started with a face-to-face meeting, conducted largely by ICT-mediated means, and concluded with another face-to-face evaluation or celebration of accomplishment. Second, operational definitions need to reveal their assumptions. Not only do we assert that e-leadership is about the *use* of ICT-mediated methods in a blended mode with traditional methods, but we also point out that e-leaders have responsibility much of the time for their own and/or organizational *adoption* of ICTs, as observed empirically in our case study presented later. Therefore, we offer a second, somewhat less abstract, definition that may be more useful to some researchers and practitioners. "E-leadership is the effective use and blending of electronic and traditional methods of communication. It implies an awareness of current ICTs, selective adoption of new ICTs for oneself and the organization, and technical competence in using those ICTs selected." Thus, as we define the effective use of e-leadership abstractly, it does not necessarily imply greater use of ICTs per se, but does imply (1) using ICTs when they are advantageous for various reasons, (2) using the best and most appropriate ICTs available relative to value of various resources, (3) using physically present communication channels when most appropriate, and (4) using ICTs with competence such as when we would distinguish a good face-to-face speaker from a poor one on a variety of grounds. Effective e-leaders use numerous ICTs in a range of contexts, but integrate them with physically present methods, seek out the best ones for the appropriate purposes, and know how to use them competently.

A case study: e-teaching as an example of e-leadership

Methodological approach

For the scope and purposes of this research, a single-case study methodological approach was employed (Yin, 2009). The organization studied represented a

comprehensive public university of approximately 19,000 students. The primary inquiry focus was placed on three distinct ICTs: email (Microsoft Office Outlook), online teaching platform (Blackboard) and file sharing platform (Google Docs). The rationale behind this choice was threefold. First, although most ICTs have a great deal of commonality they also differ in meaningful ways, especially in terms of their process functionality and in terms of the skills that they require from their users. The three ICTs chosen here capture quite well the entire spectrum of skills typically involved in ICTs usage and adoption. Second, within the context of this specific organization (and within the context of the overall market) these ICTs could be located at different stages in terms of their maturity. The e-mail function represented an example of mature and highly stable technology. The online teaching platform is located somewhere in the ''middle'' of the spectrum, between an emerging technology and one that is established and stable. Finally, the file sharing platform is one that is still evolving, both in terms of its design as well as in terms of its usage.

Data were collected via four main sources: structured interviews, focus groups, self-administered surveys and participant observation. Thirty structured interviews were conducted with knowledgeable informants. The interview protocol was developed as a result of an extensive literature review. Before commencing interviews, the protocol was assessed by four experts in the field. Each interview lasted approximately 35 minutes. Notes were taken during the structured interviews, and then iteratively reviewed within the research team.

In addition to the structured interviews, a self-administrated survey was conducted. The survey instrument is provided in Appendix A. The faculty list included all regular faculty, approximately 400, as well as 700 lecturers (full-time faculty without tenure-track status) and adjunct faculty as well, or a total of approximately 1100. The total faculty/chair response was 192, 21 of whom were chairs or school directors. Given the courtesy access to this list, it was not possible to track individuals and determine how representative the responses were; the sample was likely heavily skewed toward regular faculty. Deans and vice-presidents were contacted separately; 12 individuals with the title dean, associate dean, or assistant dean responded, and four vice-presidents and the president responded at the executive level. The total of all responses from institutional ''leaders'' was 209. In addition, 309 students from two large classes were also surveyed. Finally, a series of five focus groups totaling 32 students were conducted in the case of students; the analysis and focus groups were in line with the analysis of strategic conduct. The questions paralleled those asked of faculty and administrators during interviews and within the self-administered survey.

Because of the mixed methods approach, categorization of data was done by expert sorting (i.e. two of the authors who have extensive e-teaching experience and who gathered the data personally) rather than statistical methods. It was, therefore, an informal grounded theory approach based on inductive review of the data, and a discursive review of the problems identified to generate the discrete elements necessary for good e-leadership. The final combining of the elements into major factors or competencies was again done by expert analysis.

Findings

Just as e-leadership is commonly defined as a social influence process mediated by ICTs that can produce a change in attitudes, feelings, thinking, behavior, and performance, so too can e-teaching be defined as a social influence process mediated by ICTs that can produce a change in attitudes, feelings, thinking, behavior, and performance (Farr, 2010). That is, instructors clearly function as leaders of students in terms of their effective and appropriate use of influence and power (French and Raven, 1959). Teachers use legitimate power bestowed from their formal positions and instructional titles, coercive power in punishing cheating and plagiarism, reward power in assigning good grades for good performance, expert power derived from their experience and confirmed by technical credentials, and referent power as role models, coaches, and mentors. The use of ICTs by instructors functioning as e-leaders is well suited for a number of reasons. First, teaching situations in which fully face-to-face, hybrid, and fully online options not only exist, but can be compared with relative ease. Second, unlike many other areas, there is great consciousness regarding both the practices and level of performance of e-teaching (e.g. Means et al., 2013). Third, e-teaching includes various leadership relationships including dyads in which teachers work with individual students, groups in which instructors set up small learning teams, and collectives in which the instructor informs, directs, and facilitates the group as a whole. In short, e-teaching provides a remarkably lush opportunity for an exploratory case study to examine the range of effective and ineffective e-leadership practices.

Fifteen problems commonly cited (after similar concepts were combined) related to the exercise of effective e-leadership were identified in the case study. The concrete problems are organized here by similarity.

- Insufficient and poor communication: This occurs when instructors do not have detailed syllabi and auxiliary announcements of critical milestones, lack opportunities for questions and answers about assignments, or simply do not provide clear directions and examples of model answers for students to follow. This was much cited by students.
- Miscommunication: This occasionally occurs with instructors who try to lighten the tone with the types of jokes that would be used in face-to-face settings, but whose humor is misunderstood and whose irony is not grasped. Miscommunication was referenced as very common among students whose discussions are less carefully written and whose strong opinions may offend other students. This was much cited by instructors.
- Communication chaos: An excellent example of this is when a large class is asked to act in an asynchronous discussion of the whole (rather than smaller groups) in the way that might work well face-to-face with the instructor as a synchronous facilitator. However, when all students are expected to participate, which is common in online settings, a single whole-group discussion may generate dozens of threads and hundreds of postings that overwhelm students with

low-quality and repetitive comments. This was frequently noted as an aspect of student complaints about poorly organized classes.

- Lack of instructor support: Instructors weak at e-teaching either do not know how, or are unwilling to expend the effort necessary, to use techniques and technologies that facilitate a sense of community and level of interaction that most students are accustomed to in face-to-face environments. Some students actually preferred the online environment when it was well executed and thus perceived it as more efficient and flexible. The largest number of students had a slight bias toward face-to-face classes in terms of preferred environment but many students said that they happily exchanged the less communication-rich environment for increased convenience and efficiency. Relatively few students were strongly opposed to being the recipients of e-teaching.
- Poor motivation of small groups: The use of small groups (teams) in online classes is very common, and structuring and motivation of teams was much noted by both students and instructors. Motivation is strongly associated with the assignment of grades in e-teaching. Ungraded teams may have less and lower quality participation, even with peer grading which was little used because of reliability problems. The key problem when grades are assigned is in providing techniques that discourage those students that procrastinate from holding back the better students. Instructors often reduce this problem by providing mandatory process deadlines for the small groups. Timeliness of responses by the instructor was also much cited as a motivator.
- Insufficient accountability and use of accountability incentives: In face-to-face class settings, even when instructors do not take attendance, the visual presence or absence of students often still provides an incentive. According to many instructors, if one really wants to encourage participation, they must ensure that they use numerous, easily available online tools to track participation and that students are aware of this tracking. In team settings, if instructors assign individual grades, it assumes that the instructor has devised a method to determine relative contribution. If the instructor assigns a team grade, it assumes that the instructor has devised methods for detecting and penalizing students with particularly low or non-performance.
- Insufficient instructor attention: If students in small groups do not perceive that instructors are reading *everything*, including questions embedded in their group discussions, they may feel "unrecognized" and that the instructor is inattentive. When virtual teams are only evaluated by peer team members, students are likely to feel a lack of professional development. In the worst case, it leads to a sense of "the blind leading the blind". When teams are monitored by an instructor, but there are no comments or only comments at a class or team level, students may feel that they have not been assisted in their personal development. Many instructors felt that the level of customization of feedback was actually expected to be greater by students in virtual environments than face-to-face environments.
- Poor management of change: The use of new technology requires planning for smooth transitions. Even at the individual level the instructor must apply basic

change management skills to ensure a smooth transition. Examples of change management include: integrating a new video lecture series that embeds elements of video, PowerPoint, and animation; moving from a platform like Blackboard to Moodle; and moving to an electronic quizzing system. Instructors noted that they must generally plan well ahead of the planned change to become aware of the technology, try out the technology prior to using it, and check with students to make sure that it is working as intended. Frequently, they noted, the first wave of utilization must be substantially improved and refined for a stabilized, high-quality pattern of use to emerge.

- Poor understanding of ICTs: Not surprisingly, the study found that some faculty do not know how to use any aspect of an online teaching system since online teaching is not required. A number of faculty only use basic features such as announcements and content folders. A number of instructors are unaware of specialized features such as automatic tracking, videoconferencing features, etc. Of course some faculty excelled at online teaching technology, but that was a surprisingly small proportion. Some students noted that instructors indicated that they should collaborate on a single paper, but were unaware of various file sharing technologies and therefore unable to provide best practice tips.

- Underutilization of appropriate ICTs: Many faculty are aware of online teaching features and are aware of their effectiveness, but nonetheless elect not to use them because they perceive that they are difficult to use, too time-consuming to master, unreliable and/or stressful to use, or that consistent use by students is challenging. For example, videoconferencing has become much better adapted to online classroom environments in recent years but sophisticated utilization of the technology is relatively uncommon (e.g. viewing of students who are speaking, real-time online chat to accompany the lecture, real-time use of the white board, frequent switching of Powerpoint and internet sources within the videoconferencing ICT, etc.). A related example noted by some students was that while the internet was sometimes used, guest speakers were not used in their online classes, even though the technology enables it.

- Weak management of the basic and auxiliary technology: Technology issues in online teaching are common and good instructors must be able to prevent some common problems and diagnose others (e.g. if an embedded video will not play "try deleting cookies or try another server"). Technology management implies figuring out minor problems by reading a manual and doing your own troubleshooting, and reaching out to technology specialists when problems are unresolved, timely, and/or may have a systemic source (e.g. a glitch on the online system or a system outage). It also means having the ability to work around rare, but important, system outages. A number of faculty reported stopping usage of an online platform altogether after a major system-wide technology outage.

- Weak security management: Students not only post comments, but also frequently their own videos. They generally have a reasonable expectation that

such materials will not be shared outside the class without permission. Instructors noted that they must provide ethical guidelines in syllabi to curb the possibility of in-class materials being published in outside blogs or other inappropriate venues. An enormous issue in the e-teaching domain is authenticating student work.

- Insufficient trust in the instructor: All instructors strive to be honest, consistent, and fair, and academic systems reinforce these principles. However, some students noted that if they feel the class is "disembodied", and the instructor is simply a mechanistic facilitator, it is easy for them to be fearful of relatively "faceless" instructor decisions. Therefore, finding ways to re-create some ice breakers, side-bar stories, and social interactions is important to create a sense of social bonding that leads to trust in the educational setting.
- Constant contact issues for the instructor: Instructors frequently commented that they have to provide students with contact and response expectations, generally outside traditional office hours. Because of the move to a 24/7 mentality by many students in online environments, instructors need to specify likely response times, e.g. within 24 hours. Otherwise, students in online classes may expect responses seven days a week and 24 hours a day. Students did not report constant contact as an issue, probably because all critical deadlines were provided in syllabi.
- Poor oversight of diversity: Just because teams are virtual does not mean that considerations of gender and ethnic balance do not still apply. Also, when cultural topics are discussed, the instructor and students must be sensitive to a multicultural environment where great sensitivity may exist. This was particularly evident in the comments by instructors in social science settings.

In the analysis stage one category called professionalism (i.e. keeping personal and professional usage separate) was merged with leader trustworthiness. Diversity management only had positive examples. However, the question becomes, do our findings have support in the various literatures that discuss e-situations? Are there unique findings? What nomenclature best suits the broader e-leadership audience when constructing a master list?

Discussion: How do the case study findings relate to prior findings?

Because of the broad scope of e-leadership, operationalizing the concept in terms of concrete elements is not a simple proposition. As noted, there have been a number of studies that have identified various elements that relate to e-leadership in various applied settings using case and survey methods. Surprisingly, however, there has yet to be an attempt to identify a relatively comprehensive list of elements from an empirical (i.e. scholarly) study that could constitute an operational definition of e-leadership and that can be methodically tested and refined in various settings. We briefly review the literature with respect to the elements that emerged from the case study.

One set of elements much discussed in the literature has to do with communication. Communication clarity was cited in the team literature, both in terms of emergent leadership (Balthazard et al., 2009) and effective online team management (Brake, 2006; Lin et al., 2008). It was also found to be a critical competency for lead workers in team settings (Hertel et al., 2006). Miscommunication was identified as a separate skill related to not sending messages in which the affect (emotion) contradicts the content message, such as when a joke is misunderstood or a hasty message is misconstrued as a rude order (Roy, 2012; Snellman, 2014). Yet another issue is communication overload, a problem that has long existed but has become more pronounced in the digital age with the use of email increasing the communication demands on managers exponentially (Rennecker and Derks, 2012).

The need for leader support and for the leader to create a supportive online environment is mentioned widely in the literature, in both team and dyadic contexts (e.g. Dahlstrom, 2013; Fernandez and Jawadi, 2015; Lin et al., 2008; Snellman, 2014). Electronic media in organizational settings frequently strip out informal interactions, jocularity, and various types of normal social bonding that provide an important ingredient in a healthy organizational climate. Therefore, without conscientious leader support, followers can experience isolation, loneliness, and weakened sense of mission.

Related to support for individuals as people is motivation of teams. One aspect of team motivation is related to the proper structuring of teams related to task charges, introductory activities, encouragement, etc. (Cascio and Shurygailo, 2003; Fernandez and Jawadi, 2015; Malhotra et al., 2007). A related element is holding teams and their members accountable by monitoring, reporting and milestone accomplishment (Malhotra et al., 2007) and to prevent social loafing (Bryant et al., 2009; Wang et al., 2013). A final element related to online teams is ensuring adequate levels of recognition, rewards, development and advancement (Hunsaker and Hunsaker, 2008; Malhotra et al., 2007). However, team members of fully or largely online teams report a feeling that they are often less visible in line with the out-of-sight, out-of-mind nostrum. Since many online team members see fewer benefits, they may become more complacent in performing team functions or altogether abandon them.

Another major element cited in the e-leadership literature has to do with change management involving either information technology or online environments. Much of that literature involves large technology enterprise projects (Anthopoulos et al., 2016; Bakar et al., 2016; Nah et al., 2001; US Digital Service, 2016), and the transformational functions in teams (e.g. Puranova and Bono, 2009). Relatively little research has examined change management practices outside of the team and institutional levels (for an exception see Roux, 2015). The literature generally finds that change management is only that much more difficult in online environments, and that creating a positive attitude toward change becomes more difficult when an environment becomes more virtualized.

A number of elements related to technology itself are recurrent. One aspect is simply having basic awareness of technologies, no matter whether it is through

self-study or training (Lareki et al., 2010; Savolainen, 2014). Another aspect is making sure leaders know how to use ICTs competently (Cascio and Shurygailo, 2003) and blend them with traditional methods (Fernandez and Jawadi, 2015). Lack of deep understanding and comfort with "high-tech" methods can lead to massive underutilization (Fabris, 2015). A related concern is managers and leaders being able to manage technological breakdowns (Government Business Council, 2015; Holland et al., 2009). While security management is important for all organizations, it is an enormous concern for government agencies (GAO, 2013; Roman, 2013) as numerous General Accountability Office reports each year indicate.

A final cluster of elements revolves around issues of trust. The importance of creating trust is much noted in the team literature (Hertel et al., 2006; Malhotra et al., 2007; Snellman, 2014). One aspect of trust is ensuring that intrusions into one's privacy at work and home (e.g. work–life balance) are not violated in e-communications (Cascio and Shurygailo, 2003; Renneker and Derks, 2012; Wright et al., 2014). Yet another aspect of trust is in providing an environment in which diversity and cultural differences are respected as much in virtual spaces as in face-to-face ones (Malhotra et al., 2007; Roy, 2012; Snellman, 2014). The fifteen elements found in the case study are listed in Table 1 with nomenclature more suitable for e-leadership settings.

The one area that seemed somewhat neglected in our case study was change related to technology, largely because the case study is essentially a supervisory-level perspective of leadership, and change takes on a different level of significance at the institutional level in which major enterprise applications and decisions are involved

Table 1. Fifteen elements cited by the literature as sometimes problematic.

Problematic issues related to e-leadership involving ICTs
Lack of communication clarity
Miscommunication
Excessive communication complexity
Lack of leader support
Poor team motivation
Lack of accountability in virtual teams
Lack of recognition in team settings
Poor management of processes and change
Poor understanding of various ICTs
Underutilization of appropriate ICTs
Weak technology management
Weak security management
Insufficient trust in leader
Unrealistic expectations
Poor oversight of diversity

(Anthopoulos et al., 2016). All in all, however, we found the case study to be remarkably well aligned to what has been reported in the literature, and vice versa.

Core e-competencies

Using logical similarities, we have grouped the 15 issues into six skill-based competencies that successful e-leaders should aim to master. The competencies are: e-communication, e-social skills, e-team building skills, e-change management, e-technological skills, and e-trustworthiness. The generalized descriptions of the competencies, mirroring the elements above but stated in general e-leadership terms, are listed in Table 2.

Propositions for future research

While the categories suggested in this exploratory study are a useful starting point, they must be empirically tested, improved, and refined in a variety of settings. To this end, we suggest the following propositions:

Proposition 1: E-communication, e-social skills, e-team building skills, e-change management, e-technological skills, and e-trustworthiness are valid and reliable dimensions of e-leadership.

Proposition 2: Effective e-communication skills by leaders, such as communication clarity, lack of unintended messages, and avoidance of information overload, will result in positive outcomes such as higher individual productivity and higher employee satisfaction.

Proposition 3: Effective e-social skills by leaders, such as robust team interaction, customized communications, and use of rich media when appropriate, will result in positive outcomes such as higher individual productivity and higher employee satisfaction.

Proposition 4: Effective e-team building skills, such as bonding activities, accountability assurance, recognition, and developmental opportunities, will result in positive outcomes such as higher individual productivity and higher employee satisfaction.

Proposition 5: Effective e-change management skills, such as pre-planning transitions, monitoring success, and refining technology upon implementation will result in positive outcomes such as higher individual productivity and higher employee satisfaction.

Proposition 6: Effective e-technological skills, such as awareness of technology development, ability to mix methods, ability to handle breakdowns, and provide an adequate level of technological assurance, will result in positive outcomes such as higher individual productivity and higher employee satisfaction.

Table 2. Defining e-leadership as six e-competencies.

E-skills	Description of good e-skills
e-communications skills	*Communication clarity*: Communication in electronic settings is very clear, well organized, and allows for feedback to avoid errors and untested assumptions.
	Lack of miscommunication: Communication in electronic settings is especially careful not to convey unintended messages that leave the receiver feeling insulted or angry because of tone or misunderstandings.
	Management of communication flow: Ensures that the ease of communications does not invite excessive communications impeding the ability of employees/leaders to get their work done. Filters data when it may be so extensive or complex as to overwhelm employees.
e-social skills	*Good leader support*: Ensures that all employees in ICT-mediated environments are provided with customized communication from time to time. Uses richer media such as face-to-face meetings, telephone, and virtual conferencing when appropriate. Ensures that teams use robust interaction methods that are inclusive.
e-team building skill	*Team motivation*: Ensures that team building occurs in virtual teams. That is, makes sure that new teams have initial introductory activities, have a genuine sense of their purpose, and occasional encouragement. Makes sure that new virtual members are properly introduced and integrated.
	Team accountability: Ensures that individuals in virtual teams are held accountable for participating and contributing.
	Team and team member recognition: Makes sure that members of virtual teams get as much opportunity for recognition, rewards, development, and advancement as face-to-face team members.
e-change management skill	*Change management*: Provides change management techniques by pre-planning transitions, monitoring implementation, and refining technology practice with experience.
e-technological skills	*Currency with relevant ICTs*: Stays abreast of new ICTS and new enhancements of ICTs. Investigates and compares ICTs to ensure that those in use are optimally effective given a cost–benefit analysis including financial and transaction costs.
	Blending traditional and virtual methods: Use of adopted ICTs is practiced in a sensible mix with other ICTs and traditional communication methods.
	Basic technological savvy: Has sufficient skills and inclination to deal with various types of technology breakdowns in both personal and enterprise settings, either directly or with the aid of technology specialists in a timely manner. Is able to support subordinates and others when there are technology breakdowns or underperformance issues.

Table 2. Continued

E-skills	Description of good e-skills
	Technological security: Provides assurance of safe storage of information for privacy. Is vigilant against hacking and systems breaches.
e-trustworthiness	*Trustworthiness in a virtual environment*: Creates a sense of trust in the leader with regard to honesty, consistency, follow-through, fairness, and general integrity.
	Work–life balance: Does not allow virtual technologies to intrude into employees' lives excessively. Ensures demands for client responsiveness do not overwhelm employees.
	Diversity management: Ensures that support of diversity is as well monitored in virtual settings as it is in face-to-face settings.

Proposition 7: E-trustworthiness, such as creating a sense of trust in the leader, exercising professionalism, maintaining work–life balance expectations, ensuring diversity, and fostering collaboration, will result in positive outcomes such as higher individual productivity and higher employee satisfaction.

Limitations and future research opportunities

A number of research limitations can be identified. Our review was extensive and was meant to be exhaustive. We only cite research directly related to e-leadership because of space limitations. The article focuses only on concept development in order to test it in empirical settings. The article uses a qualitative method to derive categories that have face validity but need to be tested and refined. Space did not allow for a fuller discussion of some topics, such as the strengths and weaknesses of select ICTs (relative to various leadership purposes). Most importantly, however, this represents only one case study. While it can be argued that the case is quite representative, it still imposes important generalization constraints.

These limitations point to enormous and important research opportunities. Empirical testing of the central competencies needs to take place in many settings in order for theory building to have a robust foundation. Finally, it would be useful to have this new and tremendously topical area translated into materials that students and practitioners could use as they cope with translating issues related to e-leadership into recruitment, job descriptions, evaluation, and training and development.

Conclusion

While e-government and e-administration have been popular topics in the last 15 years, e-leadership in governmental contexts has been virtually nonexistent. This is not surprising since the mainstream literature on e-leadership has been fragmented

and largely devoid of theory above the micro level (Avolio et al., 2014). This is not to say that aspects of e-leadership have not been studied with various organizational effectiveness theories. However, they have yet to be integrated and defined in a meaningful way that accounts for the leadership role in concrete virtual contexts. This is unfortunate in a world in which many managers spend more time leading in virtual vs. traditional contexts. It is this gap in literature in the administrative context which this article seeks to address by providing a simple operational definition from a case study and the literature from which to start.

E-leadership is conceptualized as the effective use and blending of electronic and traditional methods of communication. It implies an awareness of current ICTs, selective adoption of new ICTs for oneself and the organization, skill in selecting from an array of traditional and electronic methods to accomplish various purposes efficiently, and technical competence in using those ICTs selected. While e-government and e-administration are important at the institutional level, it is individual e-leaders who decide on and execute policies in e-settings. Defining these behaviors is the very first step to understanding them in a theory building and empirical testing process. In this study, we support the theory building process by using a case study exploring the integrated elements of e-leadership that include e-communication, e-social skills, e-team building skills, e-change management, e-technological skills, and e-trustworthiness.

References

Allen E and Seaman J (2015) *Grade Level: Tracking Online Education in the United States.* Babson Park, MA: Babson Survey Group and Quahong Research Group, LLC.

Anthopoulos L, Siozos P and Tsoukalas I (2007) Applying participatory design and collaboration in digital public services for discovering and re-designing e-government services. *Government Information Quarterly* 24(2): 353–376.

Anthopoulos L, Reddick C, Giannakidou I and Mavridis N (2016) Why e-government projects fail? An analysis of the Healthcare.gov website. *Government Information Quarterly* 33: 161–173.

Avolio BJ, Kahai S and Dodge G (2000) E-leadership: Implications for theory, research, and practice. *Leadership Quarterly* 11(4): 615–668.

Avolio BJ, JSosik JJ, Kahai SS and Baker B (2014) E-leadership: Re-examining transformations in leadership source and transmission. *Leadership Quarterly* 25(1): 105–131.

Bakar NA, Kama N and Harihodin S (2016) Enterprise architecture development and implementation in public service: The Malaysian perspective. *Journal of Theoretical & Applied Information Technology* 88(1): 176–188.

Balthazard PA, Waldman DA and Warren JE (2009) Predictors of emergence of transformational leadership in virtual teams. *Leadership Quarterly* 20(5): 651–663.

Bannister F and Connolly R (2011) Trust and transformational government: A proposed framework for research. *Government Information Quarterly* 28: 137–147.

Brake T (2006) Leading global teams. *Industrial and Commercial Training* 38(3): 116–121.

Bryant SM, Albring S and Murthy U (2009) The effects of reward structure, media richness and gender on virtual teams. *International Journal of Accounting Information Systems* 10(4): 190–213.

Cascio W and Shurygailo S (2003) E-leaders and virtual teams. *Organization Dynamics* 31(4): 362–376.

Dahlstrom T (2013) Telecommuting and leadership style. *Public Personnel Management* 42(3): 438–451.

Fabris C (2015) US postsecondary faculty in 2015: Diversity in people, goals and methods, but focused on students. FTI Consulting.

Farr S (2010) *Teaching as Leadership: The Highly Effective Teacher's Guide to Closing the Achievement Gap*. San Francisco, CA: Jossey-Bass.

Feeney M and Welch E (2012) Electronic participation technologies and perceived outcomes for local government managers. *Public Management Review* 14(6): 815–833.

Fernandez B and Jawadi N (2015) Virtual R & D teams: From e-leadership to performance. *Journal of Applied Research* 31(5): 1693–1708.

French J and Raven B (1959) Bases of social power. In: Cartwright D (ed.) *Studies in Social Power*. Ann Arbor, MI: University of Michigan Press.

GAO (2013) Cybersecurity: National Strategy, Roles, and Responsibilities Need to be Better Defined and More Effectively Implemented. GAO-13-187. Washington, DC: Author.

Government Business Council (2015) *Delivering on Digital Government: A Candid Survey of Federal Managers*. Washington, DC: Author.

Grossman L and Vella M (2014) How Apple is invading our bodies. *Time* 184(11): 40–47.

Groysberg B (2014) The seven skills you need to thrive in the C-suite. *Harvard Business Review* 18 March.

Hertel G, Konradt U and Voss K (2006) Competencies for virtual teamwork: Development and validation of a web-based selection tool for members of distributed teams. *Organizational Psychology* 15(4): 477–504.

Hilbert M and Lopez P (2011) The world's technological capacity to store, communicate, and compute information. *Science* 332(6025): 60–65.

Holland JB, Malvey D and Fottler M (2009) Heath care globalization: A need for virtual leadership. *The Health Care Manager* 28(2): 117–123.

Holzer M, Zheng Y, Manoharan A and Shark A (2014) *Digital Governance in Municipalities Worldwide (2013–2014)*. Newark, NJ: National Center for Public Performance at Rutgers.

Hunsaker PL and Hunsaker JS (2008) Virtual teams: A leader's guide. *Team Performance Management* 14(1/2): 86–101.

Lareki A, Marinez de Morentin JI and Amenabar N (2010) Towards an efficient training of university faculty on ICTs. *Computers & Education* 54: 491–497.

Lin C, Standing C and Liu Y-c (2008) A model to develop *effective* virtual teams. *Decision Support Systems* 45(4): 1031–1045.

Malhotra A, Majchrzak A and Rosen B (2007) Leading virtual teams. *Academy of Management Perspectives* 21: 160–170.

Means B, Toyama Y, Murphy R and Baki M (2013) The effectiveness of online and blended learning: A meta-analysis of the empirical literature. *Teachers College Record* 115(March): 1–47.

Meijer A (2015) E-governance innovation: Barriers and strategies. *Government Information Quarterly* 32(2): 198–206.

Moon MJ, Lee J and Roh C-Y (2014) The evolution of internal IT applications and e-government studies in public administration: Research themes and methods. *Administration & Society* 46(1): 3–36.

Nah F, Lau J and Kuang J (2001) Critical factors for successful implementation of enterprise systems. *Business Process Management Journal* 7(3): 285–296.

Norris DF and Moon MJ (2005) Advancing e-government at the grassroots: Tortoise or hare? *Public Administration Review* 65(1): 64–75.

Puranova R and Bono JE (2009) Transformational leadership in context: Face-to-face and virtual teams. *Leadership Quarterly* 20(3): 343–357.

Rennecker J and Derks D (2012) Email overload: Fine-tuning the research lens. In: Derks D and Bakker AB (eds) *The Psychology of Digital Media at Work*. New York: Psychology Press.

Roman A (2013) Delineating three dimensions of e-government success: Security, functionality, and transformation. In: Gil-Garcia JR (ed.) *E-Government Success Factors and Measures*. Hersey, PA: IGI Global.

Roux L (2015) Public service values and e-administration: An explosive mix? Illustration drawing on the case of the Family Allowance Funds in France. *International Review of Administrative Sciences* 81(2): 227–244.

Roy S (2012) Virtual collaboration: The skills needed to collaborate in a virtual environment. *Journal of Internet Social Networking & Virtual Communities,* article ID: 629512.

Savolainen T (2014) Trust-building in e-leadership: A case study of leaders' challenges and skills in technology-mediated interaction. *Journal of Global Business Issues* 8(2): 45–56.

Snellman C (2014) Virtual teams: Opportunities and challenges for e-leaders. *Procedia—Social and Behavioral Sciences* 110: 1251–1261.

US Digital Service (2016) *US Digital Services Playbook*. Washington, DC: Author.

Van Wart M (2011) *The Dynamics of Leadership*. Armonk, NY: M.E. Sharpe.

Wang J, Tian J and Shen Z (2013) The effects and moderators of cyber-loafing controls: An empirical study of Chinese public servants. *Information Technology Management* 14: 269–282.

Wright KB, et al. (2014) Work-related communication technology use outside of regular work hours and work life conflict. *Management Communication Quarterly* 28(4): 507–530.

Yin RK (2009) *Case Study Research: Design and Methods*, 4th edn. London: Sage Publications.

Yong S-T and Gates P (2014) Born digital: Are they really digital natives? *International Journal of e-Education, e-Business, e-Management and e-Learning* 4(2): 102–105.

Montgomery Van Wart is a professor at California State University and an honorary professor at the University of Hong Kong, who researches in the areas of leadership, management, ethics, and human resources. mvanwart@csusb.edu.

Alexandru Roman is Associate Professor, College of Business and Public Administration, California State University San Bernardino. He is also the Director of the Research Institute for Public Management & Governance.

XiaoHu Wang is a professor at City University of Hong Kong, researching on topics of leadership, financial management, and environmental management. xwang1989@gmail.com

Cheol Liu is an assistant professor at KDI School of Public Policy and Management. His research agenda is to diagnose various risks in the fiscal health of government, including corruption, and identify implementable proposals for reform. cliu@kdischool.ac.kr

Appendix A. Contemporary effects of virtuality in administration

https://az1.qualtrics.com/jfe/preview/SV_3CWA2LWD5tn1wLb.