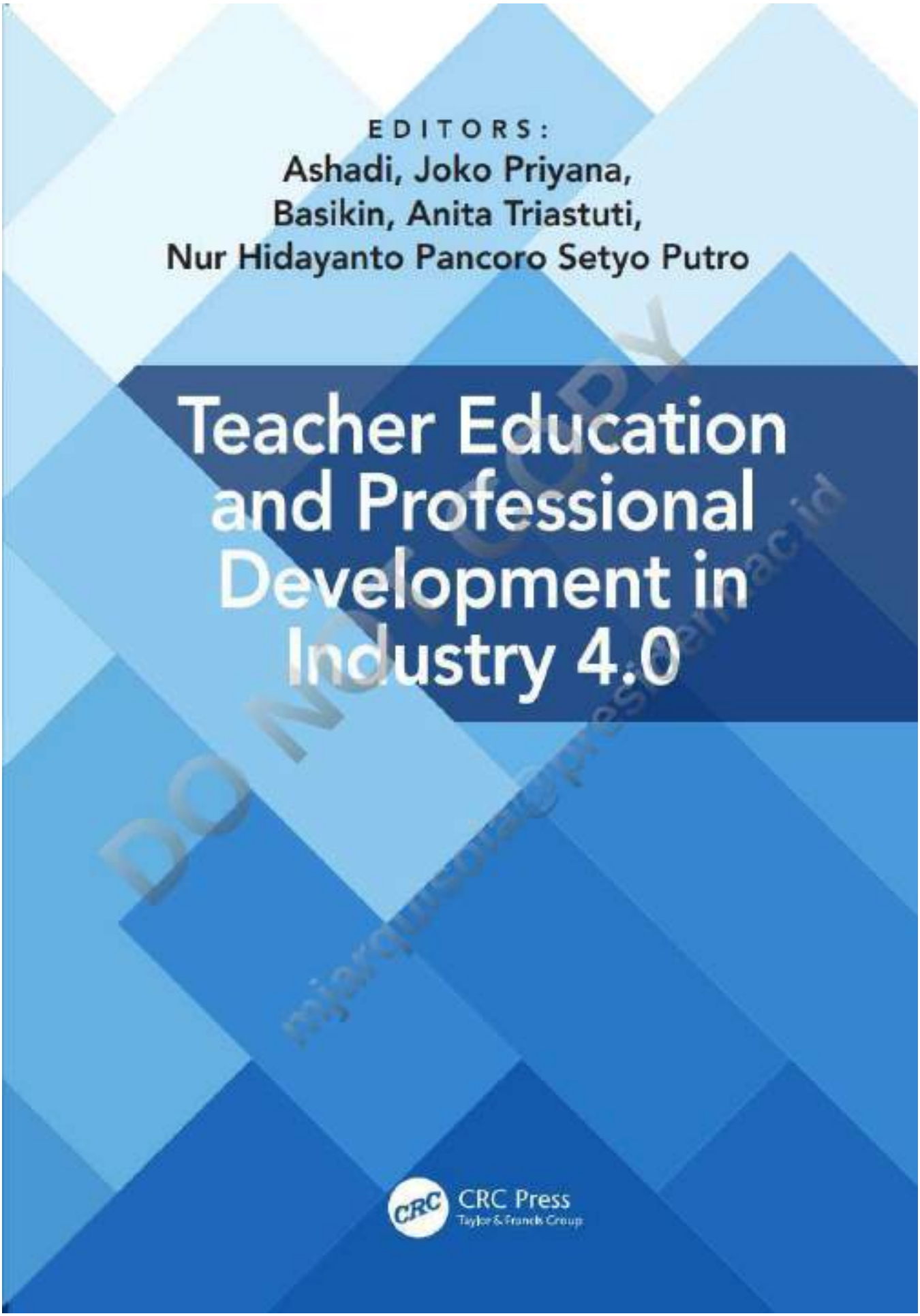

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Can Indonesian educational leaders respond to rapid contextual changes in a digital age? A narrative of issues and challenges

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ABSTRACT: This study aimed to examine the complexities that Indonesian educational leaders (ELs) experience in the course of steering their institutions to respond to rapid contextual changes, in this case, the impact of advancing technology. Thirty-five Indonesian ELs were interviewed for two months to document their experiences in role performance as academic leaders. Four complexities hindering them from addressing rapid contextual changes were identified, i.e.: (1) a need for a less bureaucratic resource allocation system, 2) a need for sufficient financial resources and better facilities, (3) a need for better role preparation and human capital development, and 4) a need for better work-life balance for educational leaders. Addressing these needs will enable ELs to perform their educational roles effectively in responding to advancing technologies. Implications to policy and practice are discussed.

1 INTRODUCTION

The purpose of this study is to focus a critical lens on the complexities that Indonesian educational leaders (ELs) experience in the course of steering their institutions to respond to rapid contextual changes, in this case, the impact of advancing technology. In April 2018, President Joko Widodo launched *Making Indonesia 4.0*, the country's national roadmap for tackling and addressing the demand for skilled workforce in this new era of technological advancement and innovation known as Industry 4.0 (IN4.0). This period refers to the current trend of automation and data exchange in manufacturing technologies (Usman 2018). It is deemed a technological revolution because of its scale and impact, and the way it transforms human activities using automated methods. According to Liffler and Tschiener (2013), the basic principles of IN4.0 are the incorporation of machines, workflows, and systems, by applying intelligent networks along the chain and production processes to control each other independently. Sung (2017) identified the following challenges of IN4.0: a) information technology security issues, b) reliability and stability of production machines, c) lack of adequate skills, d) reluctance to change by stakeholders, and e) the gradual phasing out of human labour due to automation.

Furthermore, then Vice President Jusuf Kalla stated that in the development of IN4.0, the support of competent and talented workforce is necessary, since according to him, IN4.0 and human resources competency are closely related (Hartomo 2018). Hence, one of the challenges that Indonesia faces is the readiness of its workforce for automation and advanced technology. Indonesia is the 4th largest workforce in the world, and unfortunately very lacking in talent (Insiderstories.com 2018). The advent of rapid technology and IN4.0, therefore, needs greater attention from all stakeholders in the educational, business, and professional spheres. The role of education leaders in this current landscape calls for it to be more strategic. Significant technological changes related to artificial intelligence and machine learning, for example, will require better change management interventions so the workforce can transition gradually to automation. Therefore, high-quality education plays a significant role in preparing the country's skilled workforce. More importantly, educational leaders will be at the forefront of this challenge as they are responsible for steering the country towards this goal.

Role theory guides this study of educational leaders' roles in changing contextual landscapes. Role theory has found prominence in the study of managing universities and the higher education system (e.g. Brennan 2010); in the development of educational leaders (Gronn 2003), and in how academic leaders utilise their multiple roles in times of change and complexities (Jones 2011, Jones et al. 2012). Undertaking a study that documents how educational leaders navigate the constraints of their roles in this period of significant change is timely, and provides an important contribution to the expansion of the study of educational leadership in an Indonesian context. A study by Ngo (2013) suggests Indonesian ELs experience tough choices in the process of leading, and tensions often occur in aligning teaching, learning, and managing stakeholders' demands (Bolden et al. 2008, Degn 2014), resulting in unbalanced workloads and stress (Devlin 2013). Indonesian ELs suffer the same paradoxes of "freedom and constraint", and "creativity and conformity" (Stryker 1994) in the performance of their roles. This dimension to Indonesian ELs' roles has not been examined previously, therefore extending our knowledge on educational leadership in Indonesia. The study therefore aims to answer the research question: What issues and challenges do Indonesian ELs perceive that would hinder them from addressing rapid contextual changes in the sector?

2 LITERATURE REVIEW

ELs are men and women who participate in a process of leading universities through which educational values and identities are constructed, communicated, and enacted (Bolden et al. 2012, p. 15). Bolden, et al. (2008) presented four different contexts that shape or hinder ELs' experiences in performing their roles. The first is *personal context*, which refers to the personal qualities, experience, and preferences, and barriers to role performance. Barriers include frustration, burnout, or recalcitrance to face the challenges of advancing technology. The second is *structural context*, which refers to situations that may hinder or enable role performance, e.g. governance, processes and structures, responsive top management, the support of colleagues and, significantly, opportunities to develop educational leaders' capability, confidence, skills, and competence as leaders. More importantly, educational leaders have access to resources so they would experience elevated and favourable sense of identity, and also salience and heightened self-belief in their capability to lead (Motta & Molan 2008, Stets & Burke 2000).

ELs need material and non-material resources to sustain leadership and their interactions, for example, fiscal resources, facilities, and institutional policies. With limited financial capacity, ELs are encumbered, among other accountabilities, with the responsibility for staff development. They face consistent pressure from staff who clamour for opportunities to undertake skills development training, undertake research, attend conferences, and engage in socio-civic projects that require funding. Being required to do a lot with limited resources is a daunting challenge for many educational leaders because their department's performance is dependent on the support of performing and energized employees. The serious under-funding does not bode well relative to the heightened expectations for leaders and educational units to deliver quality research and better education services.

The third is *social context* which refers to the presence or absence of personal support systems, positive working relationships with chairpersons and other administrators, and encouragement and support by family and friends. Barriers include passive support or opposition, infighting, or spoken or unspoken disapproval from colleagues and subordinates. The fourth is *developmental context*, which refers to opportunities to develop human capital, is important to help someone with a pure academic transition to a leader role, and then gain or build forms of influence in the organization. Included in this condition are holistic approaches to enhance educational leaders' capabilities where they are given sufficient preparation prior to role assumption (Bush 2010, Bush & Jackson 2002), and, in the process of leading, also receive developmental interventions that enhance their skills and capabilities (Bolden et.al. 2012, Bolden et al. 2008, Cafarella & Zinn 1999, Smith 2002). Without adequate understanding, clarity, and preparation for their roles, it is argued that educational leaders will not be able to

develop a philosophy of their role leaders, and could enter their appointments with a flawed vision of the role. Lack of preparation can leave new educational leaders feeling misunderstood, unappreciated, inadequate, frustrated, and discouraged (Raines & Alberg 2003, p. 34).

3 METHODOLOGY

Criterion sampling strategy (Creswell 2013) identified the universities using three criteria: university's long history, national ranking, and growth in student population. The universities selected were all located in Indonesia's three major cities where top universities are located (Hill & Thee 2012). For participants, the criteria were age, gender, number of years prior to leadership experience, and number of years of experience in current ELs' role.

Thirty-five (35) educational leaders from six universities across Indonesia participated in the study; 14 of them were females, and 21 males. All except one were married. They were aged between 35 and 56 years old, with Islam being the dominant religion. The participants were mostly from majority ethnic groups, the Javanese and Sundanese. In terms of position, 25 out of 35 participants were Heads of Departments (HODs), while the rest were Deans, Vice Deans, and a Department Secretary.

Data were collected through semi-structured interviews conducted in the national language, *Bahasa Indonesia*. The interviews, which were conducted over a period of two months, were conducted on-site, allowing researchers to fully engage with participants in their context (Brinkman & Kvale 2005, p. 177). The study used the constant comparison method to identify the common themes arising from the coded data. The coding process used NVivo 11 software. The coded data were categorised into nodes, providing descriptive information about the context or setting from which the data were derived (Lincoln & Guba 1985, p. 203). Based on these categorised nodes, a coding protocol was established. To ensure abstractions and metaphors in the interview data were properly categorised, the help of senior Indonesian educational colleagues who were well-versed with the local ethnic language was sought (e.g. Javanese or Sundanese).

Member-checking activities were performed on site after data were analysed, which involved the participants checking and analysing back the coded data. The purpose was to allow them to check the data accuracy and credibility (Creswell 2013, p. 252, Kempster & Parry 2011). Specifically, the activities included a) two focus group discussions; b) six face-to-face meetings; c) two phone interviews; and d) three interviews via email. With member-checking, the researchers found that the interpretations made were an adequate representation of the members' own realities. Through this method, misinterpretations were avoided, further enhancing validity of findings (Kempster & Parry 2011).

4 FINDINGS

4.1 *Response to change is hampered by bureaucratic resource allocation system*

ELs will be able to respond actively to rapid contextual changes if reforms occur in reducing the prevailing bureaucratic procedures for funding approval and disbursement. ELs perceive that it is the long, bureaucratic, and circuitous approval processes (*'there are interconnected, rigid regulations for how the funds are to be used'*—quote from Educational Leader (EL) #17) that cause delays in the disbursement of funds. An EL explained:

> *It is the bureaucracy that is our biggest obstacle, from the university down to the faculty. Our program implementation is therefore very lengthy, often delayed. Our external parties do not know about this but our bureaucracy here is very, very rigid* (EL #12).

An EL commented that the bureaucratic internal procedures *'force me to be slow in my response'* (EL #12), affecting responsiveness levels, resulting in *'minimum levels of service'* (EL #12) to stakeholders. She further adds that if they know how to circumvent the circuitous system, *'then it makes it very fast…but you see, I do not like to make a noise, like an animal*

looking for food' (EL #12). This latter statement depicts how an EL facing this situation feels derogated by the system, yet at the same time, does not want to be humiliated by the system's failure to support her role as an educational leader.

ELs believe that Indonesia's rigid bureaucracy has resulted in the unequivocally slow implementation of plans and programs, and feelings of decreased salience and power by ELs. While ELs believe that their *'institutions have a good vision, and top management understand this vision and what needs to be achieved'* (EL#32), they also believe that top management similarly feels incapacitated by not being able to achieve the vision for the institution (*'they cannot sufficiently do their jobs because the system is considered burdensome'*- EL#32) because the internal machinery blocks the actualisation of the vision. Therefore, as front-liners, ELs must carry the burden of implementation for top management, putting more strain on them and their teams: *'so eventually it is us, the lower staff, the teaching staff, and the research staff, who carry the brunt of this problem'* (EL #32).

Delays in program implementation often stretch for months, and sometimes programs must be put on hold because of the *'lengthy bureaucratic process as we have to ask the approval of this and that person'* (EL #24). One EL says that while his department is one of the biggest income-earners in the Faculty given its ability to attract many students, they never get to enjoy the fruits of their labour. However, while the rigid bureaucratic process is burdensome, many ELs understand that it is part of the government's effort to improve governance in higher education. Better accountabilities in the allocation and use of funds are deemed necessary to minimise corruption in the education sector (Wicaksono & Friawan, 2011), as commented by an EL: *'Our management is just too careful, I understand. We are being watched'*- (EL #24).

4.2 *Response to change needs sufficient financial resources and better facilities*

Tied to the problem of bureaucracy is the lack of fiscal resources allocated to public and private universities. ELs feel that the problem in the financial system *'presents us all with big hurdles'* (EL #35). ELs in this study who belonged to privatised and autonomous state universities report a decline in financial support from the government. They are affected by this regulation and have to do more with less. Specifically, it means ELs are expected to help their cash-strapped universities improve education quality despite the obvious lack of funding (*'My pressure? I can think of only two words: lack of funding. It is extremely difficult to achieve anything at the moment. We have lack of commitment from the top to fund our external activities'* - (EL#3). Moreover, the need for additional infrastructure is one issue that ELs in this study are struggling to make heard by management. ELs reported that they have been advocating for better office facilities for their lecturers and staff. One EL in Central Java said, *'I have been screaming for these facilities, especially laboratory for my students'* (EL #10).

ELs report that the lack of funding affects them (*'How can we manoeuver freely if these funding problems are controlling us?'* -EL #10). The situation causes ELs to sometimes feel desperate. ELs report that their university sometimes suggests for the educational staff to take the initiative to source funds for their department. A female EL, feeling quite angry at this problem, once confronted her Dean and told him that *'my lecturers are already over-loaded. Don't give them this responsibility of looking for money. Don't burden them!'* (EL#34). ELs in this study contend that they would like top management to be more responsive in their attitudes in dealing with these problems. Part of responsiveness is continuing dialogue with ELs, to enable ELs to give feedback on operational issues plaguing their departments, and for top management to give their response, and address these issues. Top leader responsiveness will also aid *'lower-level leaders like us to unite the resources'* (EL #1). In conclusion, they need top management to listen to them.

4.3 *Response to change needs better role preparation as part of human capital development*

Interviews with ELs show that selection is generally side-tracked in favour of a speedier process, using a *'personal approach'* where anyone who is deemed qualified is requested to consider

the assignation. An EL commented that *'if one has achieved a certain educational rank, experience, then, ergo, it is assumed that the person is ready to be a leader'* (EL#8). Therefore, it has been the experience of some ELs in this study that accepting the job of an educational leader is like *'inheriting a field, you can plant any seeds you like, grow any vegetables you like'* (EL#14).

This statement connotes leaders' roles that are unstructured, unclear, and ambiguous. This issue further highlights the problem of lack of preparation for educational leadership roles that can result in job stress, and feelings of inadequacy for the role. An EL recommends that the appointment process for leadership needs to be improved, and he is speaking generally, for Indonesian higher education: *'that is one of the key problems of Indonesian higher education leaders: appointment is without integrity'* (EL#35). This perception was corroborated by another EL who said *'When we got promoted, we did not know what to do, so I just flow with the role'* (EL #9). ELs relied on the support of their program secretaries for routine administrative activities; others relied on the advice and guidance of their previous mentors, and the support of their peers. Nevertheless, data show that ELs would like to see definite, formal plans for succession *('I think there should be a clearer structure to develop educational leaders'* – EL#1*)*. ELs in this study would like to see a blueprint for educational leadership roles, and leadership succession, designed and implemented. As a male EL commented:

> *There should also be a kind of map, a blueprint for hierarchy development but also for people of the same level. There should be a blueprint of the duties, assignments, obligations, and so forth. These blueprints are currently not very clear. We have to put everything on the map very clearly* (EL #1).

4.4 *Response to change needs ELs to have better work-life balance*

With massive contextual changes in education, ELs' job demands have increased tremendously since they must coordinate productively with lecturers, colleagues, staff, and students to maintain an over-all functioning structure. ELs in this study complained about the heavy administrative workloads, judging the administrative work to be *'repetitive, doing the same thing continuously'* (EL#33), yet needing their constant attention. To ELs, work overload is at the top of the least satisfying aspects of their job, regarding it as *'really burdensome'* (EL#15). Therefore, ELs feel that they have lost a lot of productive time, *'so much of our work is consumed by non-educational matters'* (EL#9); it is *'unpleasant'* (EL #15), and the workload *'eats up a lot of my precious time'* (EL #17) compared to his major job which is to teach. Yet, despite the help that is extended to them, many of these lecturers *'don't care about this function'* (EL #33); they continue to submit *'mediocre reports'* (EL #31), much to the dismay of educational ELs in this study. They believe that the solution is *'having competent human resources who can operate new and efficient systems, although we don't have these new systems in place'* (EL #15), comparing Indonesia to Malaysia, its nearest more advanced neighbour. Another EL said that the conflicts between managing and teaching have been made all the more complicated, because the administrative burden of having too many students is a challenge and yet frustrating, commenting that *'it impedes our productivity and creativity to do other things because most of our time is spent on teaching'* (EL #34).

It appears from this statement that ELs feel that the lack of skilled human resources is a fundamental issue that should be addressed by their institutions. If a comprehensive human resource development program could address staff capability deficiencies, then ELs could focus their energy on doing other productive activities like research, searching for external funding, or improving the teaching delivery/curriculum materials. Despite this obstacle, however, ELs feel that as educational leaders, it is important to look at the problems positively by aiming to *'continuously improve the management control system so we can adapt to the challenges and the changes'* (EL #15).

5 DISCUSSION

The experiences of ELs in this study confirm the views of Degn (2014) who argued that ELs suffer from the conflicts of establishing educational legitimacy to maintain educational status, yet, at the same time, must perform expected leadership roles. Stryker (1994) called this the paradox between 'freedom' (educational legitimacy) and 'constraint' (leadership restrictions). Findings show that it is the *structural context* (Bolden et al. 2012) that is most problematic for ELs. It has been emphasised that the 'current mechanism for the allocation and channelling of education funds is very complex and needs to be simplified in order to achieve greater efficiency and accountability' (Hill & Thee 2012, p. 239).Therefore, due to the inter-connected nature of leading and managing, findings in this study suggest that Indonesian HEIs need to evaluate, in a fair and objective manner, the gains of their departments through the performance of their ELs. The rapid changes in national education policies, the continuing struggles and debates related to the new curriculum, and the lack of fiscal resources have made the life of ELs more challenging and complicated (Arquisola 2016). On top of that, ELs feel there is consistent pressure from national education regulatory bodies for higher education institutions to abide by quality control mechanisms, accreditation requirements, and research and publications, putting more administrative pressure on Indonesian ELs. These workloads sit on top of the teaching workloads but are included in a leader's duties.

Findings suggest that there appear to be differences in core values between what the institution expects from ELs (to manage and lead), and what the ELs value as their core passion; teaching, because they believe that first and foremost, they are academics. Consistent with the findings of Turnbull and Edwards (2005), role conflicts can lead to confusion, uncertainty, and discomfort, and as ELs showed, feelings of desperation. ELs feel the brunt of pressures due to the resource deficiencies identified in this study. Consistent with Spendlove's (2007) argument, resource deficiencies have resulted in a high cost to scholarship and leadership for ELs, as evidenced in this study.

Responsiveness, as argued by Mantere (2008), relates to top management providing their educational leaders timely feedback on their performance, mentoring (where necessary), and sorting through issues affecting their performance. Through this mechanism, personal issues and grievances of ELs and their subordinates can be identified, or top management could provide resources, and adjust workloads, to stimulate scholarship and research (Benoit & Graham 2005). Findings in this study enhance the extant literature on the role that resource deficiencies play on educational leadership, by identifying the different barriers causing role conflicts for educational leaders in non-Western settings.

From the findings, the study found that another barrier is caused by *developmental context* (Bolden et al. 2012). There is no institution-wide, planned, and systematic development program for heads of departments. There is no preparation before assuming the role, and ELs report there is no clear job description, or job accountabilities. Some ELs expressed a sense of grievance that they did not receive sufficient support from their institutions in the development of their careers as educational leaders. While it is true that the majority of ELs in this study had previous experience of between 5-10 years as Department Secretary, this experience helped them understand only the administrative requirements of the job, which was about managing administrative paperwork, scheduling classes, and coordinating course delivery. Gallant (2014) calls this a micro-focus experience rather than the big picture experience that leadership requires. There is no preparation before assuming the role, for example, in management and leadership, or financial management, and there is no job contract or clear job description. Some of them relied on the support of their program secretaries for routine administrative activities; others relied on the advice and guidance of their previous mentors, and the support of their peers.

Without preparation, research has shown that even those who are deemed competent and qualified and well-suited for a leading role may still find the transition from an educational to management and leadership roles to be difficult. Leaders must fill different roles and encounter different aspects of the environment. The lack of preparation for educational roles can leave new educational leaders feeling misunderstood, unappreciated, inadequate, frustrated,

and discouraged (Raines & Alberg 2003). These arguments underline how crucial sufficient preparation is before leadership roles are taken on, as shown in studies by Bush and Jackson (2002) and Bush (2010). Preparation of educational leaders is important to succeed in the role as shown in other studies by Bush and Jackson (2002) and Bush (2010). Aziz et al. (2005) suggest that training in preparation for an educational leader's role and responsibilities would be helpful in minimising role ambiguity and conflict, and enable leaders to contribute meaningfully to the functioning of their departments. One avenue that scholars suggest for preparation is having a mentor to the leader protégé'. It is seen as a transformative relationship in which the mentor is actively invested in shaping the protégé's worldview, acting as role model in the sharing of experiences, ideas and insights, and his/her potential contribution to the institution (Murphy 2003).

6 IMPLICATIONS TO POLICY AND PRACTICE

Studies have proposed improvements in the financial management system to enable HEIs to respond quickly to the changing demands in higher education (Hill & Thee 2012, Welch 2007, Nizam 2006), by assessing the efficiency of the resource allocation system in higher education, which is considered to be bureaucratic and circuitous. This reform will ease up the burden currently facing Indonesian ELs as they need to plan and implement programs to improve student and academic competencies needed to address rapid technological changes, in this case, the challenges of IN4.0. They need to purchase better laboratories and work stations. They need to send their academics to training on the latest automated technology. This conundrum is not helpful at all to Indonesian ELs in this study as they appear to be tossed between a rock and a hard place in terms of wanting to achieve their goals with limited resources, and limited authority to dispose of these resources. Nevertheless, agencies like the World Bank have asked the national government to consider carefully giving Indonesian HEIs more money via block grants, similar to the one implemented by the New Zealand Tertiary Education Commission that Indonesian HEIs can use at their discretion. Another scheme proposed is to provide incentives to universities to seek other sources by matching any funds raised privately, fostering a greater sense of self-ownership and independence (World Bank 2014, p.47).

7 CONCLUSIONS

The barriers, in terms of structural resource limitations, and developmental skills gaps to Indonesian ELs competencies to lead their institutions in this rapidly changing context have been identified and their implications to leadership practice have been examined. The study concludes that the absence of organisational resources or apparatus to engage in wilful determination to perform their roles has been a big stumbling block for Indonesian ELs in the discharge of their duties as leaders. The study identified these stumbling blocks as absence of a responsive bureaucracy, lack of fiscal resources, lack of facilities, lack of role preparation and development, and lack of management engagement through active communication with ELs. ELs are required to do more with much less support. If these barriers are systematically reduced, Indonesian ELs will have feelings of increased salience as leaders and therefore will be able to perform their roles effectively in response to rapid contextual changes.

REFERENCES

Arquisola, M.J. 2016. *Roles of Higher Education Academic Leaders in Indonesia*. Unpublished doctoral dissertation. Deakin University, Melbourne, Australia.

Aziz, S., Mullins, M., Balzer, W., Grauer, E., Burnfield, J., Lodato, M. & Cohen-Powless, M. 2005. Understanding the training needs of department chairs. *Studies in Higher Education*, 30(5), 571–593.

Benoit, P. & Graham, S. 2005. Leadership excellence: Constructing the role of department chair. *Academic Leadership: The Online Journal*. Retrieved from www.academicleadership.org/volume3/issue1.

Bolden, R., Gosling, J., O'Brien, A., Peters, K., Ryan, M. & Haslam, A. 2012. *Educational leadership: Changing perceptions, identities and experiences in UK Higher Education* (Vol. 3). London: Leadership Foundation for Higher Education.

Bolden, R., Petrov, G. & Gosling, J. 2008. Tensions in higher education leadership: Towards a multi-level model of leadership practice. *Higher Education Quarterly*, 62(4), 358–376.

Brennan, J. 2010. Burton Clark's The Higher Education System: Academic Organization in Cross-National Perspective. *London Review of Education*, 8(3), 229–237.

Brinkman, S., & Kvale, S. 2005. Confronting the ethics of qualitative research. *Journal of Constructivist Psychology*, 18, 157–181.

Bush, T. 2010. Succession planning in England: New leaders and new forms of leadership. *School Leadership and Management*, *31*(3), 181–198.

Bush, T. & Jackson, D. 2002. A preparation for school leadership: International perspectives. *Educational Management Administration & Leadership*, 30(4), 417–429.

Cafarella, R. S. & Zinn, L. F. 1999. Professional development for faculty: A conceptual framework of barriers and supports. *Innovative Higher Education*, 29(4), 241–254.

Creswell, J. W. 2013. *Qualitative inquiry and research design: Choosing from five different approaches*. Los Angeles: Sage.

Degn, L. 2014. Identity constructions and sensemaking in higher education: A case study of Danish higher education department heads. *Studies in Higher Education*. doi: 10.1080/03075079.2014.881345.

Devlin, M. (2013). Effective university leadership and management of learning and teaching in a widening participation context: Findings from two national Australian studies. *Tertiary Education and Management*, 19(3), 233–245.

Gallant, A. 2014. Symbolic interactions and the development of women leaders in higher education. *Gender, Work, and Organization*, 21(3), 203–216.

Geonn, P. 2003. *The new work of educational leaders: Changing leadership practice in an era of school reform*. London, UK.: Paul Chapman Publishing.

Hartomo, G. 2018. Revolusi Industri 4.0: Wapres JK: Peran SDM Tetap Jadi Inti: Okezone Economy. Retrieved on January 11, 2019, from ttps://economy.okezone.com/read/2018/06/02/320/1907666/revolusi-industri-4-0-wapres-jk- peran-sdm-tetap-jadi-inti.

Hill, H. & Thee, K. W. 2012. Indonesian universities in transition: Catching up and opening up. *Bulletin of Indonesian Economic Studies*, 48(2), 229–251.

Insider Stories. 2018, March 29. Policy Review: Preparing Roadmap for Industry 4.0 Era. Retrieved January 11, 2019, from https://theinsiderstories.com/policy-review-preparing-roadmap-for-industry-4-0-revolution-2/.

Jones, G. 2011. Academic leadership and departmental headship in turbulent times. *Tertiary Education and Management*, 17(4), 279–288.

Jones, S., Ladyshewsky, R., Smith, M., Trede, F., Flavell, H. & Chapman, R. 2012. *Leading fieldwork: Academic leadership for fieldwork coordinators*. Surrey Hills, NSW: Australian Learning and Teaching Council.

Karelaia, N. & Guillen, L. 2012. *Me, a woman and a leader: Antecedents and consequences of the identity conflict of women leaders (Working Paper no. 117)*. Singapore: INSEAD.

Kempster, S. & Parry, K. 2011. Grounded theory and leadership research: A critical realist perspective. *The Leadership Quarterly*, 22, 106–120.

Kvale, S. 1996. Interviews: *An introduction to qualitative research interviewing*. Thousand Oaks, CA.: Sage.

LeBlanc, S., London, C. & Huisman, J. 2013. Using groups to change the department head role: An organization development case. *Tertiary Education and Management*, 19(2), 127–143.

Liffler, M. & Tschiesner, A. 2013. The Internet of Things and the future of manufacturing. Retrieved on 16 August 2018 from/https www. mckinsey.com.

Lumby, J., Crow, G. & Pashiardis, P. 2008. *International handbook on the preparation and development of school leaders*. New York: Routledge.

Mantere, S. 2008. Role expectations and middle manager strategic agency. *Journal of Management Studies*, 52(2), 294–316.

Marginson, S. & Sawir, E. 2006. University leaders' strategies in the global environment: A comparative study of Universitas Indonesia and the Australian National University. *Higher Education*, 52, 343–373.

Moeliodihardjo, B., Soemardi, B., Brodjonegoro, S. & Hatakenaka, S. 2012. University, industry, and government partnership: Its present and future challenges in Indonesia. *Procedia - Social and Behavioral Sciences*, 52, 307–316.

Motta, M. V. & Bolan, V. 2008. Educational and managerial skills of educational deans: A self-assessment perspective. *Tertiary Education and Management*, 14(4), 303–316.

Mulford, B. 2009. Recent developments in the field of educational leadership: The challenge of complexity. *Second International Handbook of Educational Change, 23*, 187–208.

Murphy, C. 2003. The rewards of educational leadership. *New Directions in Higher Education*, Winter 2003, *123*, 87–93

Newton, P., Burgess, D. & Burns, D. P. 2010. Models in educational administration: Revisiting Willower's 'theoretically oriented' critique. *Educational Management Administration & Leadership*, 38(5), 578–590.

Ngo, J. 2013. Lions or Lambs? How deans lead and manage their faculties at Indonesian universities. PhD Dissertation. University of Twente, Enschede, The Netherlands.

Nizam. 2006. Indonesia: The need for higher education reform. In UNESCO (Ed.), *Higher Education in South East Asia* (pp. 35–68). Bangkok: UNESCO.

Orr, M. T. & Barber, M. 2007. Collaborative leadership preparation: A comparative study of innovative programs and practices. *Journal of School Leadership*, 16(6), 709–739.

Orr, M. T. & Orphanos, S. 2011. How graduate-level preparation influences the effectiveness of school leaders: A comparison of the outcomes of exemplary and conventional leadership preparation programs for principals. *Educational Administration Quarterly*, 47(1), 18–70.

Raines, S. C. & Alberg, M. S. 2003. The role of professional development in preparing educational leaders. *New Directions for Higher Education*, Winter 2003, 123, 33–39.

Scott, G., Coates, H. & Anderson, M. 2008. *Learning leaders in times of change: Educational leadership capabilities for Australian Higher Education*. NSW, Australia: Australian Council for Educational Research Australian Learning and Teaching Council.

Smith, R. 2002. The role of the university head of department: A survey of two British Universities. *Educational Management and Administration*, 30(3), 293–312.

Spendlove, M. 2007. Competencies for effective leadership in higher education. *The International Journal of Educational Management*, 21(5), 407–417.

Stets, J. E. & Burke, P. J. 2000. Identity theory and social identity theory. *Social Psychology Quarterly*, 63(3), 224–237.

Stryker, S. 1994. *Freedom and constraint in social and personal life: Towards resolving the paradox of self*. In G. M. Platt & C. Gordon (eds.), Self, collective behavior and society: Essays honoring the contributions of Ralph H. Turner (pp. 119–138). Greenwich, CT.: JAI Press.

Sung, T. K. 2018. Industry 4.0: A Korea perspective. *Technological Forecasting and Social Change*, 132, 40–45.

Turnbull, S. & Edwards, G. 2005. Leadership development for organisational change in a new U.K. university. *Advances in Developing Human Resources*, 7(3), 396–413.

Usman, S. 2018 Membangun revolusi industri 4.0 di era digital, ini langkah persiapannya. Retrieved January 11, 2019, from https://www.merdeka.com/teknologi/membangun-revolusi-industri-40-di- era-digital-ini-langkah-persiapannya.html.

van Ameijde, J. D., Nelson, P. C., Billsberry, J. & van Meurs, N. 2009. Improving leadership in higher education institutions: A distributed perspective. *Higher Education*, 58, 763–779.

Welch, A. R. 2011. *Higher education in Southeast Asia: Blurring borders, changing balance*. London; New York: Routledge.

Wicaksono, T. Y. & Friawan, D. 2011. Recent Developments in Higher Education in Indonesia: Issues and challenges. *Financing Higher Education and Economic Development in East Asia*, 159.

Woods, P. A., Bennett, N., Harvey, J. A. & Wise, C. 2004. Variabilities and dualities in distributed leadership: Findings from a systematic literature review. *Educational Management, Administration and Leadership*, 32(4), 439–457.

World Bank. 2014. *Tertiary education in Indonesia: Directions for policy*. Washington, D.C.: World Bank Group.