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# The dynamics of leader technical competence, subordinate learning, and innovative work behaviors in high-tech, knowledge-based industry

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**ABSTRACT**

This study tests a conceptual model for understanding the relationship between subordinates' 'learning work behaviour' and 'innovative work behaviour', with the moderating role of their leaders' self-reported as well as subordinates' rated 'leader technical competence'. The study was conducted in the context of a high-tech, knowledge-based telecommunications industry. Based on the evaluation of job description, leaders/managers with responsibilities of not only managing internal and external stakeholders but also capable to lead engineers to resolve any technical issue multiple-source data were collected from the identified leaders and their respective subordinates working with telecommunication operator ($n = 179$). This study proposed a three-way interaction moderation model between the independent variable (subordinate learning work behaviour) and the moderator variables (that is, the self-assessed leaders' 'technical competence' and subordinates' rated 'leader' technical competence') to predict the subordinates' 'innovative work behaviour'. Our results demonstrate that that subordinate learning work behaviour had the strongest positive relationship with subordinate innovative work behaviour when both the leader self-assessment of technical competence and the subordinates rated leader's technical competence were high. This study fills an important gap in leadership literature by focussing on the technical competence of leaders which has received little attention from leadership research in knowledge-based industries.

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Learning work behaviour; leader technical competence; innovative work Behaviourbehaviour; knowledge-based industries; Vietnam

## Introduction and background

The innovativeness and the learning capabilities of an organisation are crucial for increasing its competitiveness and prosperity, and ultimately for its survival.

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Additionally, organisational innovation and learning capabilities are dependent upon the knowledge skill and abilities (KSAs) of both its leaders as well as its employees. Researchers posit that not only the KSAs of the employees are necessary for proposition, development, advocating, and implementation of innovative ideas, but support from the leaders is also imperative (Mumford, Hemlin, & Mulhearn, 2017; Wen, Zhou, & Lu, 2017). This creativity and innovativeness of the organisational internal stakeholder become more critical in high-tech industries (Saeed, Junaid, & Shah, 2017). Among these, the telecommunication industry is predominantly knowledge-based, and their work practices are less rigidly designed. The ability to generate new ideas are the building blocks for developing innovative and better products, services and/or work process for the telecommunication industry, hence improving its business performance (Hult, Hurley, & Knight, 2004).

Innovative work behaviours (IWB) refers to an employee's behaviour that initiates and intentionally introduces new and useful ideas, processes, products and procedures within a work role, group, and organisation (Farr & Ford, 1990). It is an extra-role behaviour that goes beyond the scope of basic job requirements and responsibilities (Javed, Naqvi, Khan, Arjoon, & Tayyeb, 2017). Researchers have differentiated between creativity and IWB as creativity refers to only idea initiation (Baer, 2012), however, IWB refers to idea initiation, adoption, and implementation (Klein & Sorra, 1996). Research shows that leaders' support is important for both these variables, being more important for IWB (Michaelis, Stegmaier, & Sonntag, 2009) than creativity (Byun, Dai, Lee, & Kang, 2016), due to the added dimension of idea implementation. As Ma, Björk, Knudsen, Magnusson, and Karlsson (2013) categorically state that in telecom sector effective leadership can create an appropriate culture in which employees take responsibility for not only the creative process but also its implementation.

The role of leaders and managers is increasingly recognised in motivating the employees to develop and implement innovative ideas (J. P. De Jong & Den Hartog, 2007; Imran & Anis-Ul-Haque, 2011). Despite this increased interest in linking the constructs of leadership and innovation, it is noticed that; first, most of the research is focussed on the organisational level of analysis, ignoring individual roles of idea development, advocating, and implementation to some extent. Second, the behavioural research is more focussed on the creativity of an employee, hence the implementation of ideas generated through the creative process is far less explored (Danks, Rao, & Allen, 2017). Last, when investigating the leaders' impact on subordinates' IWB, the focus has mainly been on the leadership behaviours and styles rather than leaders' technical competencies, thus, resulting in a noticeable lack of literature. The Royal College of physicians in (2017) presented technical competence as one of the qualities that define a good leader. Although previous studies have focussed on the managerial competence of leaders (Hysong, 2008; Tett, Guterman, Bleier, & Murphy, 2000), this study expands the literature beyond managerial competence, behaviours, and styles by focussing on their technical competence. Investigating the issue of how these leaders, with predominantly technical competences, impact their employee' IWB is an important inquiry. So, our first research question was: what is the relationship between leader technical competence and their subordinates' IWB? This relationship

becomes even more important in the telecommunication industry, which is characterised with non-standardized tasks, complicated and ill-defined problems, novel problem solving, and leaders having technical education, skills, and experiences (Chatterjee, 2017; Zhang & Bartol, 2010).

On the other hand, there is no consensus on the definition of individual competencies. Boyatzis and Boyatzis (2008) defined it as a capability. Schoorman, Mayer, and Davis (2007) refer to it as an individual's ability to perform his/her job reliably and competently. Spencer and Spencer (2008) conceptualised it as a characteristic that predicts effective and superior work performance, whereas Levenson, Van der Stede, and Cohen (2006) termed it as a person's underlying characteristics related to the effectiveness and individual performance on the job. In knowledge-based industries, leaders must display the highest levels of technical, human, conceptual, leadership, and financial management competencies (Kondrat, 2001). Grant, Baumgardner, and Shane (1997) have identified technical competence as a significant managerial characteristic in high-performance teams. As argued by Andrews and Farris (1967) teams would be more innovative if the leader is technically competent that is he/she should know the technical details of his team's work, has an ability to critically evaluate it and align the subordinate goals with team and organisational goals. Specifically, in the context of innovation according to Hollander and Julian (1970), perceived technical competence of the leader is directly related to IWB. J. P. De Jong and Den Hartog (2007) extend this context by stating that leader is 'a driving force behind employee innovative work behaviour' and his/her competence demands from their employee to come up with up-to-date technical solutions to problems they face. Finally, Clarke, Morris, and Williams (2012) categorically state that ever-changing environment and ever-increasing organisational complexities the future of the organisations and their innovative performance depends upon leader technical competence and problem-solving capabilities. The demand for these competencies increases dramatically when the leader moves up the managerial hierarchy, however, remaining technically competent engenders respect from staff, peers, and superiors. As Raj, Goel, and Behera (2018) categorically state that in the telecommunication industry if a leader wishes to command respect he/she needs to be technically competent. Therefore, for this research, we define competency based on the leader's/manager's technical skills, knowledge and experience which enables him/her to perform reliably and proficiently. We posit that, first, technically competent leaders have up-to-date technical knowledge to perform their technical duties; second, they have a thorough understanding of technologies involved in their respective industries, and lastly, they can answer technical questions, propose technical solutions and apply their technical knowledge to organisational problems as well as encourage organisational learning. The definition of technical competence is adopted for this research as it focuses on the technical side of leader competence in the telecommunication industry. As the effects of other leader competencies like global mindset (Alon & Higgins, 2005; Jokinen, 2005), emotional intelligence, as well as communication skills (Tubbs & Schulz, 2006) are widely established in general, and the telecommunication industry in specific; therefore the focus of this study has been the scantly researched construct of leader technical competence.

As mentioned earlier leaders/managers need to create a favourable learning environment to facilitate organisational innovation and creativity. Learning is defined as the change in individual behaviour due to experiences based on actions and events (Hattinger, Eriksson, Malmsköld, & Svensson, 2014) or information and knowledge (Odirile, Mpofu, & Montsi, 2009). Edmondson (1999) defined organisational learning as an ongoing process of reflection and action, characterised by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions. Leaders build and nurture subordinates learning behaviour in their organisations which enables them to provide a foundation for organisational innovations (Garcia-Morales, Llorens-Montes, & Verdú-Jover, 2006). Results from the study of Gozukara and Yildirim (2016) display a significant and positive relationship between LWB and IWB. In another study by Pham, Pham, and Pham (2016) the interactions of LWB, IWB and leader/top management support significantly improves organisational performance in a sample of 120 companies. Furthermore, scholars argue that for any organisational, group or team level learning, it is the individual that makes the effort to learn by acquiring, sharing and combining information, testing assumptions based on the information, reflecting and discussing the assumptions, and experimenting. Based on the conceptualisation for this study subordinate LWB is defined as the process of knowledge and information acquisition, and sharing it involves setting learning goals, development goals, commitment to learning, and seeking knowledge and learning opportunities mainly through discussion and interaction with the leader.

There are two main perspectives for studying leadership in organisational context. First perspective focusses on the leader and aims at understanding how leader characteristics, behaviours, and attitudes affect individual, team and organisational performance. The second perspective focusses on the quality of relationship between the leader and its subordinates. This study adopts the former perspective and examines the vertical relationship between leader and subordination with focus on the effects of leader technical competence on the relationship between LWB and IWB. There are various studies which evaluate the effects of leadership on the relationship between LWB and IWB. For instance, Halbesleben, Novicevic, Harvey, and Buckley (2003) presents awareness regarding learning behaviours in an organisation as a critical leadership competency for fostering IWB. Jung, Chow, and Wu (2003) are of the view that by creating a climate that facilitates diffusion of learning, leaders can considerably improve employee innovative capabilities. Furthermore, the results from the study by Scott and Bruce (1994) show that leader-member exchange partially mediates the relationship between subordinate perception of an organisation's learning environment and IWB. Lastly, in their study Elenkov, Judge, and Wright (2005) state that the climates supportive of learning moderated the relationship between strategic leadership styles (transformational, transactional, and visionary) and capability of employees in displaying IWB. Despite consensus among the researchers that LWB influences IWB, the scholars have not delineated the mechanism through which leader's technical abilities affect this relationship, so the second research question was how leader technical competence influences the relationship between LWB and IWB; as Mumford et al. (2017) suggest that the effective leadership of learning and

innovative efforts in an organisation may, in fact, be the single most complex form of leadership. This study answers this question by proposing a vertical dyadic relationship between LWB and IWB and examining the moderating effects of the leader technical competence in knowledge-intensive organisations, where employees' IWB play an integral role in the organisation's competitiveness and performance.

To understand the mechanics of these links, we refer to organisational learning theory, proposing that leader's technical competence (Uhlenbruck, Meyer, & Hitt, 2003) reflects on the relationship between subordinate's LWB and subordinate's IWB. According to review of literature, the fundamental premise of this theory is to facilitate mutual communication and knowledge sharing among organisational members. Furthermore, the literature also, in general, suggests positive and organic linkages among leadership, organisational culture, human resource practices, and organisational outcomes. In specific organisational learning theory highlights the importance of leader support in creating an environment which encourages learning and HR practices that boast followers/subordinates display of LWBs. Furthermore, the theory also proposes creativity and IWB as major organisational outcomes. Mumford et al. (2017), by referring to multiple studies (for example Andrews & Farris, 1967; Barnowe, 1975; Keller, 2006; Kim, Min, & Cha, 1999; Pelz & Andrews, 1966; Scott & Bruce, 1998; Tierney, Farmer, & Graen, 1999), draws three main inference. First leaders have a strong influence on their subordinate' IWB. Second, the influence of the leader is holistic and not focussed on any organisational level. And lastly, this influence leads to supporting an environment where organisational learning prospers and may lead to enhanced creativity and organisational innovativeness. They also recommend that the leader must have exceptional technical skills and should have the capability to not only to learn himself/herself, but also to motivate their subordinates to display LWB. Eisenhardt and Martin (2000) are of the view that leader competencies integrate, build, and reconfigure the dynamic capabilities resulting from the linking of LWB and IWB to survive in the rapidly changing environment. Furthermore, a positive relationship is suggested by the theory between LWB (Hassan, Wright, & Park, 2016), leader's technical competence (Yair, Press, & Tomes, 2001) and IWB (Zejnilovic & Oliveira, 2016).

For leader's technical competence, the theory also proposes that there may be a difference when supervisor self-evaluates his/her technical competence (Weerawardena, O'Cass, & Julian, 2006) or a subordinate evaluate the leader/manager's technical competence (Autio, Sapienza, & Almeida, 2000). The organisation learning theory relates the leader's self-evaluation of his/her technical competence with the level of the leader's self-confidence. Sauer (2011) even characterises the leader's self-confidence as an individual's willingness to ' step up' as a leader. Furthermore, it is important in gaining the trust of followers (Bernerth, Armenakis, Feild, Giles, & Jack Walker, 2007), subordinate creative problem-solving skills (Halpern, 2003), increases follower confidence, and creative potential (Styvaert, 2011). Kirkpatick and Locke (1991) further state that not only leader's self-confidence is important, but also is other's perceptions of it. Thus, the theory also relates subordinates' assessed leader technical competence with the constructs of trust in leader (Javed, Rawwas, Khandai, Shahid, & Tayyeb, 2018), as well as their

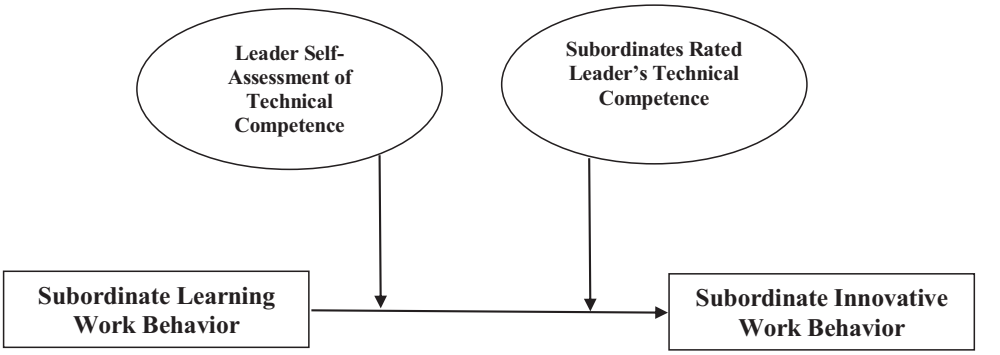


Figure 1. Theoretical framework of the model. *Source:* Authors.

confidence in their leaders (Salma, Anas, & Mohammed, 2018). This literature thus highlights the importance of both leader's self-rated and subordinate rated technical competence for explaining the dynamics of LWB and IWB relationship. Slusher, Van Dyke, and Rose (1972) presented a methodology to measure the technical competence of a leader by emphasising that not only the leaders should self-assess their technical competence, but their subordinates should also evaluate the technical competence of their respective leaders. Keeping in consideration the perspective of this study propose two moderating variables that is leader self-assessment of technical competence (LSTC) and the subordinate rated leader's technical competence (SRLTC) which may have a contingent effect in creating an organisational environment where LWB prospers in such a way that it fosters IWB. organisational learning theory based methodology proposed by Slusher et al. (1972) for the measurement of technical competence of leaders has been employed in this study. The model developed for this study is as follows:

Based on the theoretical framework depicted in Figure 1. The hypothesis proposed for this study is as follows:

> Hypothesis 1. Subordinate learning work behavior, leader self-assessment of technical competence and subordinates rated leader's technical competence interact to affect employees' innovative work behavior in such a way that when leader self-assessment of technical competence and subordinates rated leader's technical competence are both high, subordinate learning work behavior has the strongest positive relationship with their innovative work behavior.

## Method

### *Participants and procedure*

The reason we selected the telecommunication sector for this study is that it is characterised by fast technological changes, stringent requirements of technical capabilities, and high competition, thus making employee learning, innovation, and technical competence a critical factor for this industry's survival and success. The organisation selected for this study was a telecommunication operator in Vietnam. The questionnaire was circulated in English. One of the authors administered the questionnaire

**Table 1.** Descriptive of the sample.

| Average age of manager | 51 years (SD = 6.19 years) |
|---|---|
| *Manager experience in telecommunication industry* | |
| 11–15 years | 26.9% |
| 16–20 years | 44.2% |
| over 20 years | 28.8% |
| *Manager years working in the top management* | |
| 1– 5 years | 49% |
| 6–10 years | 43.1% |
| 11–15 years | 7.8% |
| *Manager professional degree* | |
| College degree in a non-technical field | 28.8% |
| Bachelor's in a technical field | 36.5% |
| Masters in a technical field | 28.8% |
| Doctorate in a technical field | 5.8% |
| Average colleagues within current organisation | 5.29 |
| Average managers within your company | 5.11 |
| Average subordinate within your company | 4.97 |
| Average previous experience | 5.76 Years |
| On average how long, the manager and subordinate have been working together for this company | 12.9 Years |

*Source:* Authors.

on-site for an enhanced response rate and ensure respondents confidentiality. Two structured questionnaires were administered: one survey instrument, containing 12 items, was administered to the subordinates, while the second one, containing 13 items, was distributed to their immediate supervisors. Based on the organisational structure of the company and the nature of our study it was ensured that data was received from employees that are in leadership positions. 68 General Managers of each subsidiary (also referred by their aides as team leaders) and their subordinate directors of each subsidiary (up to 3, predominately engineers) were identified. The job description of the leaders was also evaluated, and it was mentioned that not only will they be expected to manage internal and external stakeholders but should also have the capability to lead experienced engineers should they not be able to resolve any technical issue. The leaders were instructed to evaluate the IWB of subordinates and self-assess his/her technical competence. The subordinates were requested to self-assess their LWB and rate their manager's technical competence. 52 out of 68 managers replied (response rate 76.5%) and 127/204 subordinates replied (response rate 62.2%) resulting in multisource data (30 managers had 3 subordinate answers, 15 managers had 2 subordinate answers, while 7 managers had 1 subordinate answers). The descriptions of the sample are as given in table 1:

Keeping in view the nature of the variables, the existence of social desirability bias (SDB) was evaluated by methods suggested by King and Bruner (2000). First, Existing literature was reviewed for any evidence that reported SDB in the scales of the study. No study was identified that reported SDBs for the scales used in the study. Second, since the literature didn't provide any evidence for the existence of SDB, only minor changes were made in the survey instrument. Third, steps were taken to maximise the subject's anonymity. Lastly, the data was evaluated using multivariate outliers' test the Mahalanobis distance statistic to identify and isolate subjects with response bias in the sample. One subject was identified whose responses were duly examined and eliminated as they were not consistent.

## Measures

*Innovative work behaviour:* The leaders were requested to evaluate subordinate IWB, through a 10 items measure, on a seven-point scale, ranging from 1 = strongly disagree to 7 = strongly agree. The measure was developed by J. De Jong and Den Hartog (2010) and included questions such as 'Does this subordinate generate original solutions to problems?'. The Cronbach's α value for this study was 0.93.

*Learning work behaviour*: was measured by an 8 item (e.g. Personally, I am committed to continuous learning) scale developed by Dechawatanapaisal and Siengthai (2006). The subordinates were requested to assess their LWB on a seven-point scale, ranging from 1 = strongly disagree to 7 = strongly agree. The Cronbach α = 0.83.

*Leader technical competence*: To assess a leader's technical competence for the telecommunication industry, a 7 item measure by Chien (2007) was used. Three items (e.g. Could you rate your understanding about telecommunication networks?) of the scale were directed to the managers to self-assess their technical competence on a seven-point scale, ranging from 1 = very low to 7 = very high, while four questions (e.g. When the team members face a technical problem, the manager sometimes provides a technical solution) were directed towards subordinates to evaluate their manager's technical competence on a seven-point scale, ranging from 1 = strongly disagree to 7 = strongly agree. Cronbach's α for LSTC = 0.82 while for SRLTC α = 0.86.

## Data analysis

SPSS version 23 and Amos version 23 was used to analyse the data. Exploratory factor analysis was used to analyse the reliability of the construct (results already presented), while to validate the model, confirmatory factor analysis was used. The test results of adaptability are presented in table 2, which shows that the four-factor model provides the best fit ($\chi^2$ = 262.653, df =198, $\chi^2$/df =1.32, RMSEA = 0.046, CFI = 0.957, GFI = 0.848, and TLI = 0.950) as per adaptability standards suggested by Hair (2010) and Byrne (2013).

To test the hypothesis, we used hierarchical moderated regression. Collinearity diagnostics were also conducted with all VIF values well below 10 in the hypothesised model and mean-centered all interaction variables to reduce multi-collinearity. Finally, A three-way interaction was plotted following Aiken, West, and Reno's (1991) procedure.

**Table 2.** Model fit indices.

| Model | $\chi^2$ | $\chi^2$/df (<2) | RMSEA (<0.05) | CFI (>0.9) | GFI (>0.9) | TLI (>0.9) |
|---|---|---|---|---|---|---|
| 1 | 1115.59 (df = 275) | 4.056 | 0.156 | 0.494 | 0.494 | 0.448 |
| 2 | 794.648 (df = 274) | 2.900 | 0.081 | 0.687 | 0.631 | 0.657 |
| 3 | 634.124 (df = 272) | 2.331 | 0.103 | 0.782 | 0.714 | 0.760 |
| 4 | 262.653 (df = 198) | 1.32 | 0.046 | 0.957 | 0.848 | 0.950 |
| *Model 1 = One factor model* | | *All study variables* | | | | |
| *Model 2 = Two factor model* | | *LSATC, SALTC; IWB, SLB* | | | | |
| *Model 3 = Three Factors model* | | *LSATC, SALTC; IWB; LWB* | | | | |
| *Model 4 = Four Factors model* | | *LSATC; SALTC; IWB; LWB* | | | | |

RMSEA = root mean square error of approximation; CFI = comparative fit index; GFI = goodness-of-fit index; TLI = Tucker–Lewis index; For all $\chi^2$, $p < 0.001$.
*Source:* Authors.

## Results

Table 3 shows all variables of the study are significantly correlated with each other. Specifically, both the LSTC and SRLTC are positively related to subordinate LWB and IWB.

Four models were created to test the relationship suggested in this study as in Table 4. In M1 independent effects of LWB ($\beta = 0.53$, $t = 7.46$, $p < 0.01$) on IWB. In M2 the independent variables and moderators predicted the variance in IWB. Independent variable LWB ($\beta = 0.19$, $p < 0.05$) and moderator SRLTC ($\beta = 0.45$, $p < 0.01$) positively affected IWB while LSTC ($\beta = -0.18$, $p < 0.05$) negatively affected IWB with $\Delta R^2 = 0.19$ and $\Delta F = 8.95$ $p < 0.01$. In M3 three interaction terms were included along with the dependent and moderating variables. The interaction terms between the LWB, LSTC ($\beta = 0.26$, $p < 0.01$) and SRLTC ($\beta = 0.17$, $p < 0.05$) are significant and positively related to IWB. While the interaction between LSTC and SRLTC presents a significant yet negatively relation with IWB ($\beta = -0.31$, $p < 0.01$). In Model 4, LWB, moderators SRLTC, LSTC, interaction terms between the LWB, LSTC, SRLTC and LSTC and SRLTC are inserted with the three-way interaction term between LWB, LSTC and SRLTC (LSTC*SRLTC*LWB) having $\beta = 0.34$, $p < 0.01$ and $\Delta R^2 = 0.05$ and $\Delta F = 5.92$, $p < 0.05$ providing support for $H_1$.

A three-way interaction was plotted in Figure 2 following Aiken et al. (1991)'s procedure confirms our hypothesis which proposed that the relationship between LWB

**Table 3.** Descriptive of the study variables.

| Variable | Mean | S.D | ρ | ρvc(η) | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|
| LSTC | 5.5 | 1.01 | 0.88 | 0.72 | (0.82) | | | |
| SRLTC | 5.44 | 0.8 | 0.90 | 0.71 | 0.34* | (0.86) | | |
| LWB | 6.01 | 0.67 | 0.85 | 0.53 | 0.37* | 0.31* | (0.82) | |
| IWB | 4.91 | 0.83 | 0.93 | 0.61 | 0.56* | 0.40** | 0.52** | (0.93) |

values in parentheses are reliability coefficients (α).
**$p < 0.01$, *$p < 0.05$.
$\rho$ = Jörekog's index of internal consistency reliability.
ρvc(η)= Fornell and Larcker's (1981) index of the average variance extracted.
*Source:* Authors.

**Table 4.** Results of regression analysis.

| | Innovative Work Behaviour | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M1 | | | M2 | | | M3 | | | M4 | | |
| Independent variable | β | VIF | Tol | β | VIF | Tol | β | VIF | Tol | β | VIF | Tol |
| LWB | 0.53** | 1.00 | 1.00 | 0.19* | 1.20 | 0.83 | 0.17* | 1.71 | 0.58 | 0.21* | 1.72 | 0.58 |
| *Moderators* | | | | | | | | | | | | |
| LSTC | | | | −0.18* | 1.08 | 0.92 | −0.11* | 1.23 | 0.80 | −0.13* | 1.36 | 0.73 |
| SRLTC | | | | 0.45** | 1.27 | 783 | 0.41** | 1.37 | 0.72 | 0.31** | 1.37 | 0.72 |
| *Interactions* | | | | | | | | | | | | |
| LWB*LSTC | | | | | | | 0.26** | 2.43 | 0.41 | 0.09 | 3.59 | 0.27 |
| LWB*SRLTC | | | | | | | 0.17* | 1.73 | 0.57 | 0.15* | 1.86 | 0.53 |
| LSTC*SRLTC | | | | | | | −0.31** | 1.85 | 0.53 | −0.30** | 1.99 | 0.50 |
| LSTC*SRLTC*LWB | | | | | | | | | | 0.34* | 3.68 | 0.27 |
| $R^2$ | 0.28 | | | 0.47 | | | 0.56 | | | 0.61 | | |
| $\Delta R^2$ | 0.28 | | | 0.19 | | | 0.09 | | | 0.05 | | |
| $F$ | 17.23** | | | 26.17** | | | 31.56** | | | 37.49** | | |
| $\Delta F$ | 17.23** | | | 8.95** | | | 5.39* | | | 5.92** | | |

**$p < 0.01$, *$p < 0.05$.
*Source:* Authors.

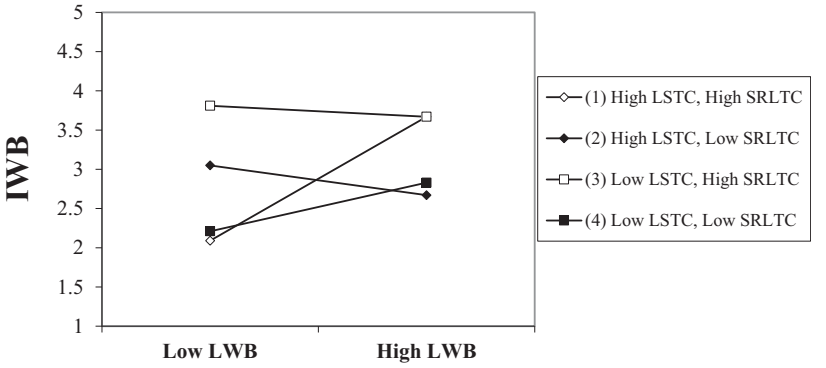


**Figure 2.** Three-way interaction plot. *Source:* Authors.

**Table 5.** Simple slopes comparisons for three-way interactions.

| | Innovative work behaviour | |
|---|---|---|
| Pairs of comparison | Slope | t |
| 1 (High LSTC, high SRLTC) | 0.62 | 4.27** |
| 2 (High LSTC, low SRLTC) | −0.26 | −1.04 |
| 3 (Low LSTC, high SRLTC) | −0.05 | −0.13 |
| 4 (Low LSTC, low SRLTC) | 0.31 | 1.13 |
| Slope difference | | |
| 1 and 2 | | 3.08* |
| 1 and 3 | | 3.94** |
| 1 and 4 | | 0.82 |
| 2 and 3 | | −0.61 |
| 2 and 4 | | −1.19 |
| 3 and 4 | | −0.82 |

*Source:* Authors.

and IWB was moderated by LSTC and SRLTC in such a way that LWB had the strongest positive relationship with IWB when LSTC and SRLTC are high.

Table 5 presents the simple slopes and slope difference tests related to Figure 2. The test results suggested that LWB fostered greater IWB when both LSTC and SRLTC were high (condition 1: $t = 4.27$; $p < 0.01$). Conversely, when employees lacked LSTC, and/or had lower levels of SRLTC [conditions 2 ($t = -0.26$; $p > 0.05$), 3 ($t = -0.05$; $p > 0.05$), and 4 ($t = 0.31$; $p > 0.05$)], LWB was insignificant. Moreover, simple slope difference indicated that the interaction between LWB and SRLTC was significant when LSTC was high (Slopes 1 and 3; $t = 3.94$; $p < 0.001$), and the interaction between LWB and LSTC was significant when SRLTC levels were high (Slopes 1 and 2; $t = 3.08$; $p < 0.05$), further supporting Hypothesis 1.

## Discussion

The role of leadership is highly recognised in knowledge-based industries like telecommunication to promote IWB. Moreover, LWB has been identified as one of the most important constructs that foster IWB and it is the responsibility of the leader to create a favourable learning environment where this relationship could foster. However, these studies have conceptualised leadership behaviours as an organisational level construct thus ignoring leadership characteristics like their technical

competencies that could influence IWB. The organisation learning theory enables us to assess the dynamics of these relationships. The theory also highlights that when it comes to assessing the technical competence of the leader, both the subordinate assessment of leader technical competence and leader self-assessed technical competence should be taken into consideration. keeping in consideration the perspectives of organisational learning theory this study proposed and examined the vertical relationship between leader and subordination with focus on the effects of leader technical competence (both subordinate-assessed & self-assessed) on the relationship between LWB and IWB.

A conceptual model of the moderating effects of leader self-reported and subordinate rated leader technical competence on the relationship of LWB and IWB was investigated that had previously received limited attention in the leadership literature. LWB has a positive relationship on IWB which is widely recognised in the literature (for example, Xu, Zhao, Li, & Lin, 2017). Similarly there also exists a positive correlation of both moderators LSTC and SRLTC with LWB and IWB (Carlborg, Kindström, & Kowalkowski, 2018). It is worth mentioning that SRLTC has a negative effect on IWB (M2 to M4). These unique findings are explained by Dunning, Heath, and Suls (2004). They categorically state that leader holding overly inflated self-views rarely enhance innovation and performance as these inflated self-views lead to overconfidence which results in leaders being seen arrogant hostile and maladjusted by their subordinates. Bass, Yammarino, and and others (1991) further state that the leaders' self-assessment about their competence tends to be inflated in comparison to subordinate's ratings. The results of their study also demonstrate that successful leaders are less likely to inflate their self-described competence. Both the independent moderating effect of LSTC and SRLTC strengthen the positive relationship between LWB and IWB. These independent interactions are in line with existing literature as leader/manager competence strengthen the relationship between employee learning and performance-based variables like IWB, for example, McEnrue (1984) posits managers self-perceived competence strengthens the positive relationship between clarity of employees about their organisational learning roles and performance. Furthermore, Chandler and Hanks (1994) state that a leader's competence moderates the relationship between the learning opportunities provided by the organisation and IWB. Koo and Lee (2018) are of the view that competence has a positive moderating role between the relationship of LWB displayed in external R&D project and innovative performance. Lastly, in the context of the high-tech industry of telecommunication, our findings suggest that leader technical competence has a significant strengthening effect on the positive relationship between LWB and IWB when both leaders LSTC SRLTC are high. These results have interesting theoretical and practical implications.

First, this study informs the telecommunication industry about the positive impact of a leader's technical competence on subordinates' learning and innovation. The results of this study suggest that technically competent leaders can solve subordinates work-related technical problems, thus, inspiring and motivating them to commit themselves towards learning and innovations. However, the results also show that both leader self-assessment of his/her technical competencies and the subordinate's assessment of leader technical competencies should be high to achieve this impact.

The study, henceforth, recommends that leaders need to update and enhance their technical KSAs to an extent that they are intrinsically and extrinsically confident about their competencies as results show that subordinate's perception of the leader regarding his/her technical competencies is as important as the leader's self-assessment. Hence, it is recommended that leaders should be rational in appraising their technical skill and give due consideration to what subordinates think about their competencies.

Second, this study fills an important gap in the leadership literature by focussing on the technical competence of leaders/managers, which has received little attention from leadership researchers. Majority of studies conducted on the relationship of leadership with LWB and IWB focus on leadership behaviours, styles, and skills (Chang, Bai, & Li, 2015; Pham et al., 2016). We take a step further by taking into consideration the subordinate's and leader's own perspective regarding leader technical competence, hence, gratifying a proposition of organisational learning theory for knowledge-based industries.

Third, this study focuses on LWB at an individual level, thus, contributing to the organisational learning literature which is dominated by firm and team level perspectives (Gozukara & Yildirim, 2016; Pham et al., 2016; Weerawardena et al., 2006). This research supports and expands the existing work on learning by suggesting a mechanism with which leaders, through their technical competence, can influence individual learning and innovative behaviour. That is, in high-tech organisations, leaders having technical competence are in a better position to coach and monitor individuals for increasing their developmental readiness to display IWB.

The study has three main limitations. First, only the technical competence of the leader was considered due to the purpose and context of the study (telecommunications industry). For future studies, other potential variables like the leader's managerial competence may be used. Second, the investigation took place in the telecommunications industry and no other industry was considered. It is, therefore, recommended that future studies can examine these relationships in other industries. Finally, this study focussed on the technical competencies of leaders and ignored subordinate technical competence. Future research may investigate the combine moderating effects of leader and subordinate technical competence on the relationship between LWB and IWB.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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