



Intellectual Stimulation for Technological Innovation-A Review of Literature

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Abstract: The modern leadership literature has built a case for transformational leadership as a key approach for organizations pursuing to build a favourable environment for creativity and innovation as a driver for performance and growth. However, the literature is faulted that it leaves knowledge gap on how each of the Four I's of transformational leadership contribute towards technological innovation of the organization. This papers reviews extant conceptual, empirical and theoretical literature and presents a case for new theoretical model contributing to the existing knowledge on the role of intellectual stimulation as a key component of transformational leadership in enhancing technological innovation in the organization. The paper further proposes an integrated theoretical model relating intellectual stimulation with technological innovation while recognising the role played by conducive work environment and industry velocity in the highly dynamic environment.

Keywords: Intellectual stimulation, Technological innovation, Transformational leadership

1. INTRODUCTION

Organizations in the 21st century are facing diversified challenges in effort to remain afloat and survive the dynamic environmental conditions. The organizational management are forced to review their strategies thus opening up to various innovative ways in the internal processes for competitive advantage. The environment has also become dynamic with forces of globalization changing how the business is done. The employees are expected to exhibit high levels of job satisfaction, motivation and customer centric service which calls for innovative ways of offering their services (Judge & Klinger 2008).

Studies have shown that it is effective leadership that creates a favourable organizational relationship between the employees and their supervisors and influence for positive behaviour such as innovative work behaviour in an organization (Burns 1978; Yukl, 2002; Zhou & Shalley, 2003). Leadership influence for innovation has been attributed to the style of leadership exhibited by the leader and the leader-follower relationship in the organization.

It is in the pursuit of the approaches to motivate employees and build a culture of change and employee engagement to organizational goals that many organizations have embraced transformational leadership (Shin & Zhou, 2003). Further, Burns (2012) presents transformational leadership as a modern approach to leadership that appeals to the followers' moral values and aims at raising their morale and improve their motivation towards their role in the organization (Yukl, 2013).

It is transformational leadership that is associated with the performance beyond expectation by linking employees' self-concept with organization's mission and influences their subordinates to think and act out of the box nurturing innovative behaviour (Pradhan & Jena 2019). Leaders who embrace transformational leadership approach in the running of the organization are reported to positively influence innovation both at individual, team and organizational levels (Jaussi & Dionne 2003; Sosik, 1997). This modern leadership style has been studied under four dimensions which have come to be known as the Four I's of transformational leadership. These dimensions are: Inspirational motivation, Intellectual stimulation, Individualised consideration and Idealised influence (Burns 2012).

Pradhan and Jena (2019) in their study established that the four I's in the transformational leadership created an environment of significant relationship between transformational leadership and employee's innovative work behaviour. Such leaders will positively influence their employees to transcend beyond their status quo and innovatively create solutions for various challenges facing the organization. Transformational leaders are also known to create high performance environment which provokes the employees to creativity and innovativeness (Mainemelis et al, 2015).

A study by Leiponen (2008) on knowledge intensive organization identifies the intellectual assets as a key factor in driving innovative behavior in organizations. These organizations highly depend on how well knowledge is stimulated for competitive advantage. In such organizations, creativity and innovation is a key objective where investment in incentives and knowledge creation is a strategy for both survival and success in the industry they operate in. The study findings conclude that these organizations will either establish research and development units or will equip their employees who happen to be their main(intellectual) assets with skills, access to technology and enabling environment for creativity and innovations (Pradhan & Jena 2019; Mainemelis et al, 2015; Van Knippenberg & Sitkin 2013).

2. STATEMENT OF THE PROBLEM

Though there has been studies on how transformational leadership has impacted the 21st century organization, there remains various gaps on its impact on the innovativeness and competitiveness in the strategic platform. Various scholars have opted to limit their scope to the general concept of transformational leadership without narrowing down to the various behaviours as represented by the four I's (Jyoti& Dev 2015; Ahangar 2009; Mainemelis et al, 2015). Whereas there remains consensus among the scholars that transformational leadership creates an environment of motivation, creativity and high performance, differing opinion on how each of the four I's have contributed remains an area for future research (Shin& Zhou 2003; Masi & Cooke 2000).

Various studies which have focused on the intellectual stimulation have pointed out that the success of this behaviour in transformational leadership depends on both the leader as the initiator and the willingness of the followers (Ahangar 2009; Kaya & Patton 2011; Jung, Chowb & Wuc 2003). The leader's role has been pointed towards creating an environment of openness, stirring learning behaviour, encouraging motivation and creativity. Whereas the leader's involvement is key in making the style a success toward innovation, there still remain gaps on the role of the followers in embracing change, willingness to adopt new ways, transforming their thought process and consistently maintaining discipline for positive change.

In addressing innovation and its space in the strategic expansion of an organization, studies have broadly studied how organizations have embraced innovations to outdo competition. Organizations that ignored creativity, change and innovations have slowly become docile and some are already extinct (Zuraik & Kelly 2019; Schmitt, 2012). On the other hand, the organizations that have persistently embraced and sustained innovations have remained resilient over the various hurdles along their path. Innovative spirit remains an individual initiative which involves not only one's behaviour and skills but also the cognitive composition (Mitchell et al., 2007). Further, the influence of the leader on the employee remains a rather wide scope creating great potent area for scholarly research. Similarly, the study of innovation is wide, leaving gaps and opportunity for future studies both from the leader's and followers' perspective a well.

The paper will review extant conceptual, theoretical and empirical literature in the area of intellectual stimulation aspect of transformational leadership and the implication for technological innovation. This will further recommend a theoretical model to advance research and knowledge development in leadership.

3. CONCEPTUAL LITERATURE

3.1. Concept of Intellectual Stimulation

Bass (1999) improved the initial works of Burns (1978) by highlighting the elements of transformational leadership which have been referred to as the Four I's of transformational leadership. Besides Intellectual stimulation, Bass (1999) sheds light on the other Three I's which represents Idealised influence, Inspirational motivation and individualised consideration. Whereas idealised

influence improves the followers' identification with the leader, intellectual stimulation makes followers to look at challenges from different perspective and creativity in solving them. On the other hand, individualised consideration is involved in coaching and providing encouragement to the followers while inspirational motivation focuses on communicating appealing vision and direction to the followers (Bass, 1999).

This term intellectual stimulation traces its origin in the work that has been advanced on the model of leadership called transformational leadership. This is tied to the evolution that has been experienced on the trait of transformational leadership. The first scholar who proposed the theory of transformational leadership was Burns (1978) which was later developed and enriched by Bass and Avolio, (1995). The term has been defined as the capability by the leader to take risks, solicits followers' ideas and stimulates creativity and innovation by use of various tools such as asking questions, thinking deeply and figuring out better ways of achieving the various roles (Bass 1995; 1999).

Through the years, there has been various theoretical reviews and approaches to transformational leadership (Bass,1995;Bass & Steidlmeier,1999; Avolio et al 2004).This study acknowledges the foundational works by Burns (1978) and the improvements by Bass (1995;1999) which introduced the Four I's approach. In a later improvement to the concept, Yukl (2013) describes intellectual stimulation as transformational leader's behaviour that influences followers to view problems from a new perspective and use it to search for more creative solutions. This is in line with the Northouse (2016) description where the leader's behaviour expands and magnifies their team's intellectual capacity to handle challenges and develop creative solutions.

3.1.1. Perspectives and Dimensions of Intellectual Stimulation

To achieve the objectives of this study, relevant concepts relating to intellectual stimulation has been discussed. Intellectual stimulation originates from the leader who by use of various stimulation tools extends the same to the followers triggering creativity and innovation for greater performance (Burns, 2012). The leaders are said to use motivating tools such as metaphors and stories to frame how the members of an organization thinks towards achieving organizational objectives. For instance, the leaders may motivate the employees into higher creativity and performance by making the employees to visualize how their hard work and commitment has propelled the organization to greater performance (Cleavenger & Munyon 2013).

According to Avolio, et al (2004), leaders who are intellectually stimulating take time to motivate their employees to take thought of how they conduct their work and also stir them to innovative ways of doing it more effectively. Kark, Shamir, and Chen, (2003) further highlights that leaders will exhibit intellectual stimulation approach through empowering their employees to make decisions within an environment of delegated authority. The employees will be challenged to come up with creative solutions to various challenges within their work space which ends up building their creativity and innovation.

The construct of intellectual stimulation as an element of transformational leadership has been commended for creating an environment of creativity and innovations in an organization (Jyoti & Dev, 2015; Ahangar 2009). The employees are motivated to use their innate and acquired skills to bring the best out of them for overall organizational performance. They are driven to inspiration by the need to counter competition and thus position the organization at a competitive advantage. Over the long run, intellectual stimulation as part of transformational leadership positively influences creativity and innovations (Ahangar 2009).

Tepper (2018) highlighted that it is the intellectual stimulating behaviour in the transformational leader that makes team members to respond better to various situations especially when they face various challenges at their work place. Whereas each individual has own task and duties, most organizations have embraced team and group work to take advantage of synergy in performance. In such a group working environment, Avolio (2010) posited that intellectual stimulation brings the best out of a team for a higher performance.

Jaroliya and Gyanchandani (2020) on the impact and role of transformational leadership in an IT team environment is one of the recent studies linking intellectual stimulation and the technological

innovativeness of the team. The author pointed out that transformational leaders motivate their teams to higher technological performance through providing them with proper direction and stirring the spirit of creativity.

This paper views that technological innovations are key strategies for the modern organization especially for competitiveness and high team performance. Though a leader is expected to handle other organizational roles such as controlling, leading, staffing and coordinating, it is intellectual stimulation in the transformational leader that propels and sustain the team to high creativity and innovations (Thomas 2017; Strauss, 2009). Further, the construct of intellectual stimulation has been associated with bringing clearer vision, more cohesive team and shared direction through improved learning and skills impartation (Khan, 2017).

Unique and charismatic approach by transformational leaders has been credited to inducing important shifts in perspective and presumptions of team members making them committed and creative to their purpose (Tajasom, (2015). The individualised support that the team receives from their leaders improves their morals and behaviours especially when faced with distress at the work place enabling an environment of exemplary performance (Singh & Krishnan 2007; Strauss, 2009). It is the impact of intellectual stimulation at individual, team and organizational level that has made the behaviour to be highly rated in knowledge intensive industries and credited with subordinates' growth, raising the team morale to perform at its best (Leiponnen, 2008). The study further connects the construct of intellectual stimulation to its related dimensions of empathy, open communication, mentoring, servanthood and creativity.

3.1.2. Empathy

Goleman (2009) highlighted empathy as one of the five components of emotional intelligence and describes it as the leader's ability to understand the emotional make up of other people. It also equips the leader with skills enabling them to treat other people according to their emotional reactions. Managers who exhibit empathy in their leadership have been considered better performers by their supervisors. In the same approach, managers who are empathetic to their direct reports are also considered high performers by their supervisors and were also viewed as high performers by their subordinates (Holt & Marques 2012)

The ability to be compassionate and empathetic is key in building a motivated team which by extension provides a favourable environment for creativity and innovations. The competence when applied in a work environment have been commended that it builds cohesion and improves communication within the employees. Individuals with empathy are seen to easily understand situations from the perspective of others and makes them to react with compassion. According to Polychroniou, (2009) empathy differs from sympathy in that it goes beyond feeling of pity and compassion to putting oneself in other's shoes.

Empathetic leaders are in a position to identify signs of fatigue and burn out time enough before it adversely affects productivity and at times lead to staff exit. The leader will require to take quality time with the subordinates in order to identify and rectify stress, fatigue and burnout. The leader will also show concern and interest in the needs and expectation of others with aim of matching the assignments in a way it leads to high performance and staff satisfaction. This concern will stir the employees towards cordial relationship and improved performance (Holt & Marques 2012).

Empathetic leader understands that the employees have both work and personal life which are mutual factors in a working environment. This type of a leader will show forth their concern and compassion towards employee's personal needs while maintaining the professional space. Besides showing concern, the empathetic leader will take a step to reduce the level of negative effect by of the employee's personal needs (Polychroniou, 2009).

According to Holt and Marques (2012), some leaders are more empathetic than others; however, empathy as a leadership competence can be learnt and developed as a trait. The development can be done through coaching, mentoring or through developmental and growth initiatives. Organizational management can improve the levels of empathy through constant talk about empathy in the work place and putting emphasis on its significance. Training on listening skills is key in developing one's empathetic traits. Leaders who are keen to listen to their team members will build more cohesive and thus productive team (Polychroniou, 2009)

3.1.3. Open Communication

Communication in an organization facilitates coordination of the various management functions which work together towards the success of its activities. All the managerial functions; planning, organizing, staffing, coordinating and controlling are all fuelled by communication processes in the organization. According to Ivancevich, Konopaske and Matteson (2014), communication is the glue that holds the organization together. It is communication that enables both short term and long term strategies, response to changes in the organization environment.

For an intellectually stimulating leader, communication is a key tool to not only pass relevant information, receive feedback but it is also an important aspect in creating an environment of trust, creativity and performance. It is the leader's effective communication skills that motivates and stirs the organization into creativity and innovations through sharing what they have and what they expect of the team. It is the good communication in an organization that enables the leader to develop better understanding and beliefs that inspire and motivate the team (Luthra & Dahiya, 2015).

Communication is the aspect upon which two key leadership styles closely links the intellectual stimulating leader with the creativity and performance of the organization. The people centric leadership is one that is built around the team members with aim of maintaining the morale of the motivated lot and stir to action the lazy and the laid back (Luthra & Dahiya, 2015). The other style is leadership based on the intellectual levels of the team they lead. The leader adjust their communication based on the maturity of their team members. The maturity levels are not based on the age but on the capability to handle complex situations potential of achieving various targets. The intellectually stimulating leader will thus adjust their leadership method which further has influence in the performance.

Kouzes and Posner (2011) pointed out that followers will only open up to follow, submit and trust a leader who they term as credible. This is a leader who has created an open communication environment, who listens and gives attention to their concerns. It is the leader who uses communication to share the guiding vision with them and takes into themselves to walk the talk with them. It is the great communicators who become great motivators and effective mentors.

3.1.4. Mentoring

Opengart and Bierema (2015) describes mentoring as a developmental relationship that occurs between a more experienced individual called a mentor and a less experienced usually referred to as protégé. It is a relationship built on close relationship with an aim of progressively developing the protégé. Mentoring facilitates the process of socialization in an organization and develops and builds the creativity and innovation of the team members (Allen et al 2004). It is further related to motivation, improved performance, development of skills and better chances for promotions and career progression.

An intellectually stimulating leader is one who is available to provide guidance and mentorship to the followers. It is this relationship that opens up deeper engagement between the leader and the team members facilitating an environment of creativity and innovations. The skills improving relationship is beneficial not only to the mentor and the protégé but also to the overall organization (Eby, Durley, Evans, & Ragins, 2006).

The intellectually stimulating leader creates an environment where the team members and their leaders benefit from the mentorship relationship. There is free flow of information, skills and motivation which sets the organization for higher levels of creativity and performance. Ragins and Verbos (2007), posits that the leader who is open and honest about own mistakes builds a higher level of trust with the team members who will yield more in the mentorship relationship. The leader achieves more by being deliberate in showing keen interest in the agenda of the followers both work and personal lives without compromising performance. Leaders who develop their followers through mentorship often incorporates servant leadership approach in impacting the required skills and creativity.

3.1.5. *Servanthood*

Servant leadership originated from the writings of Greenleaf (2002) who brought in the paradoxical view of a leader as both a leader and a servant. Saleem, Zhang, Gopinath and Adeel (2020) describes servant leadership as a modern leadership approach where the leader interacts with the constituents to achieve authority rather than power. It has also been viewed as a leadership style that links ethics, morals and virtues (Carter & Baghurst, 2014). The uniqueness of this leadership is the focus by the leader to create a balance from not only directing but also serving at the same time. It has been seen as a modern solution to need for ethical balance in an organization.

Van Dierendonck (2011) posits that servant leadership is built on trust between the leader and the rest of the team. It is more centred on the leader who deliberately becomes attentive to the concerns and the interests of the followers, empathizing and nurturing them. The leader will put the followers first by empowering them and building their potentials. A servant leader is seen to exhibit some identifying traits such as: listening, empathy, healing, awareness, persuasion, conceptualization, foresight, stewardship and commitment to building others and the community.

Northouse (2016) in highlighting the role of a servant leader in the performance of the organization associates the style with “thorough understanding of the organization—its purposes, complexities, and mission. This capacity allows servant leaders to think through multifaceted problems, to know if something is going wrong, and to address problems creatively in accordance with the overall goals of the organization” (p.233). This aspect makes the intellectually stimulating leader to be well positioned to stir the team towards set goals in innovation and creativity.

In the views of Van Dierendonck (2011), the servant leadership within the intellectual stimulating leader will pursue a plane of motivation in leadership and seeks for opportunity to serve their followers. The leader will operate in an assumption of “I am a leader and thus I serve” contrary to the ancient approach of “I am a leader and thus I lead”. This approach has therefore been seen to make the followers to open more to the leader creating a favourable environment for learning, creativity and innovations (Parris and Peachey 2013).

3.1.6. *Creativity*

The subject of creativity has been at the heart of many organizations as one of the strategies of surviving in a highly competitive and dynamic environment. An entrepreneurial leadership will always be at creative table, coming up with novel and innovative products, services and processes. Thus creativity has been viewed as a continuous ongoing process that starts in the mind and translated to reality by bringing out products or services that are different from the existing ones (Harding, 2010).

According to Shang, Chong, Xu and Zhu (2019), leaders who are keen to see their organizations grow and embrace creativity will be conscious of the different roles each team member plays in the whole process. Most creative ideas emanate from the followers whom given the right environment will bring out their potentials. This contrasts the ancient ‘top-down approach’ where the top management comes up with the strategy which they push to middle and lower level managers for implementation. The lower level employees are thus brought to the creativity table by provoking their thought process and allowing them to freely express their imagination on various platforms (Van Dierendonck 2011).

The intellectually stimulating leader will create creative opportunities for the staff first by acknowledging the diversity of skills and competencies within the team. The success of the leader will be in situations where the followers are recognised and allowed to express their creativity without fear of failure. The leader offers an encouraging support to the team by assuring the team of his backing even when they make mistake in attempt to perfect their creativity. Feedback both to and from the team is key in building confidence and cohesion which is key in building the morale of the team. It is the role of the leader to enhance training either through on job exposure or theoretical upgrade of skills required for creativity which has been closely related to technological innovation (Harding, 2010).

3.1.7. *The Concept of technological Innovation*

Oke et al. (2009) posited that “Innovation is a multi-faceted concept that has been described as the quest for finding new ways of doing things” (p.67) while according to Gumusluoglu and Ilsev (2009), “It includes the creation and commercialization of new knowledge” (p. 464). Janssen et al., (2004)

conceptualised innovation as the intentional generation and realization of new ideas both within the role of an individual or a team in an organization. It is at the individual level that the term is taken to refer to the effortful process of developing and applying the creative ideas to bring about change (Janssen, 2004). On the other hand, Anderson and West, (1998) describes team innovation as the collective and concerted generation, development and implementation of creative ideas for creative change in an organization.

The term has been studied under four areas: process, product, marketing and organization innovation (Mortensen et al., 2005). Other scholars have divided innovation into commercial, organizational and institutional taking place in three types of contributions: radical, architectural and incremental (Bhaskaran, 2006; Lipparini & Sobrero, 1994).

Technological innovation is thus seen as the process through which improvement and changes on technology are introduced (Tidd & Bessant, 2009). The innovation may be process innovation which introduces better and more efficient way of doing things or product innovation which entails improving or coming up of newer version of the product. The aim of technological innovation is to increase efficiency, improve convenience to the customer or to minimize cost and thus improve the profitability margins for the organization.

Kim et al (2018) points out that technological innovation in its application and based on its speed or width can be in various forms: radical, incremental, continuous, discontinuous, product and process innovation. Radical innovations involve introducing products, services having new functions while incremental innovation means changes in existing technological functions. On the other hand, continuous innovations depict improving or strengthening existing industrial structure while discontinuous means creating next generation product and industrial restructuring. This study thus holds technological innovation as one which takes the form of process innovation which involves adoption of new process that improves efficiency and leads to improved quality of the product.

Tidd and Bessant, (2009) in the role of technological innovations for competitiveness and entrepreneurship posited that firms that embraced technological innovations in their products and processes were better positioned to thrive in the small enterprises field. This supports the views by Erturk (2009) that enterprises focusing on the human resource and financial resources to support technological innovations proved resilient within the market that they operated.

Over the years and since 1978 when transformational leadership approach was embraced as a modern style of leadership, there has been major interest by scholars. Pawar (2003) highlighted that the works of Burns (1978) on transformational leadership was based on societies and movements which are non-profit making organizations. The construct has thus attracted several scholars in attempt to conceptualize the values to goal oriented and profit driven organizations. Further, there is a conceptual gap of the separating line between transformational and transactional leadership. While the transformational leadership is accredited with the raising of the followers to a higher level of aspirations and innovations, it is transactional leadership that identifies the needs of the followers, equips them to fulfil and also rewards attainment of these goals.

4. LITERATURE REVIEW

This section of the study undertakes to report extant conceptual, empirical and theoretical literature that leads to comprehensive understanding of the constructs the theories that underpin their relationship.

4.1. Theoretical Review

The scope of this study has been guided by transformative leadership theory and two innovations related theories: the diffusion of innovation theory and Disruptive Innovation Theory

4.1.1. Transformative Leadership Theory

The theory was coined in 1973 by Downton but was not in use until the classic work of political sociologist James MacGregor Burns in his classic work 'Leadership' in 1978. The sociologist sought to bring out relationship between leadership and followership where he posited that 'leaders are people who tap the motives of followers in order to better reach the goals of leaders and followers' (Northouse, 2016). The approach is where the leader connects to the followers raising their level of

motivation and morality, is concerned with the followers' needs and motives and aims at helping the followers to achieve full potential.

Burns (2012) highlights that in transformational leadership, both the leader and the followers benefit from the interaction in a way that the potential of both is maximised. The theory is anchored on four leadership pillars commonly referred to as the "Four I's": idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. The theory has been closely intertwined with having charisma in the leadership which Northouse, (2016) describes as having "as a special personality characteristic that gives a person superhuman or exceptional powers and is reserved for a few, is of divine origin, and results in the person being treated as a leader" (p.164).

The theory has been credited in that it brings significant change in both the leader and the followers in an organization. Where the concepts of transformational leadership are incorporated in a new leadership, the behaviour tends to change creating motivation and enthusiasm for work. The theory is based on premise of relationship where the leader and the follower sustains a mutual relationship. The leader is seen to possess the skills that develop successful relationship with followers in an environment where both focuses to meet the organizational goals. Based on this, a reciprocal and interdependent relationship is built which increases trust and sense of belonging. In such a relationship, creativity and innovation is birthed and nurtured within the organization (Murphy, 2005).

This study positioned the theory as key in that it hypothesizes the developing positive relationship between the leader and their constituents, the latter feels valued and gets more motivated to work towards the vision and voluntarily offer their contributions towards the accomplishment of the organizational objectives. This becomes a platform for innovation and creativity for competitive advantage (Murphy & Drodge 2004).

The theory however fails to identify other probable mediating and moderating factors that may influence innovation and creativity of the team. Factors such as the psychological factors in the team, training and skills, existing working environment or other personal factors which may positively or negatively influence the performance (Erturk 2009; Tajasom 2015). Thus the high performance in innovation and creativity cannot be solely associated to the leadership style. The study thus creates scholarly research gaps which requires the incorporation of other leadership and psychological theories.

Other critics feel that transformational theory fails to address all possible 'leader-follower' relationship situations. For instance, in an organizational setup, some requirements of the leader's job can negatively affect this positive relationship. Some roles such as tough disciplinary action against the 'naysayers' or action in resolving conflicts which may seem to work contrary to the building of the leader-follower relationship. In other instances, the theory may fail to actualize where the followers deliberately block their mind on issues raised by management where resistance to change and desire to maintain status quo hinders transformational leadership agenda (Tajasom 2015).

4.1.2. Diffusion of Innovation Theory

Rogers (1962), developed the first model of diffusion and defined diffusion of innovation as, "the process by which innovation is communicated through certain channels over time among the members of a social system" (p.27). According to Rodgers (2003), diffusion refers to how innovations are passed on or communicated over time through various channels. The flow of the innovations is affected by the perception of the population on what they consider to be acceptable and non-disruptive. People will also accept innovations when they are presented through modes they consider familiar and trustworthy. According to Rodgers (2003), the diffusion process "consists of four key elements: innovation, the social system which the innovation affects, the communication channels of that social system, and time" (p.29)

In applying this theory, modern organizations that have secured competitive advantage in their industry have been keen on how they introduce technological innovations. It is the acceptability of the technology and usage that gives the organization an advantage over their rivals. This study found the theory relevant in that it sets the ground upon which an intellectually stimulated leader will introduce innovation. It is the traits of such a leader that will package innovations in acceptable and non-disruptive option. It is only in such circumstance that the followers will willingly yield to the leader for creativity and innovation.

4.1.3. Disruptive Innovation Theory

This theory was initiated by Prof Clayton Christensen who found out that there are innovations which make a product or service to be introduced in the market as less expensive or with minimal disruption but gradually takes trajectory to overtake other more pronounced products. The innovations are initially rated inferior to other mainstream technologies but over time in their performance, they deliver better results than their counter parts (Christensen, 1997).

The theory highlights that at the introduction stage, innovation has minimal impact and is barely accepted by the targeted parties. The same also affects minimal market segment and is considered irrelevant to the competition at this stage. However, at subsequent developmental stages, the innovation starts to influence more market segments and starts to disrupt the competitive outlook. The theory was later advanced to have two categories: one for low end and the other for new market disruptive technology. "Whereas the low-end disruptions attack the least-profitable and most over-served customers at the low end of the original value network, new-market disruptions is found to create new value network, where it is the non-consumption, not the incumbent, which must be overcome" (Christensen, Raynor & Anthony 2003).

The theory's relevance to the current study comes both at the technological innovation initiation, development and launch into the market. The transformational leader will involve the team in all levels of the innovation while stirring their interests, creativity and enthusiasm to its climax. It is the innovations that have the backing of the leadership and the motivated teams that will disrupt the existing competitive markets (Yu & Hang 2010).

4.2. Empirical Literature Review

The study reviewed construct empirical literature in attempt to highlight the various knowledge and research gaps on which the various propositions of the study have been developed.

4.2.1. Intellectual Stimulation and Technological Innovation

Intellectual stimulation is one of the four I's under which its umbrella transformational leadership approach is formed. The other three I's stand for Individualised consideration, Idealised influence and Inspirational motivation. It has been associated with the leader's ability that makes followers to look at challenges from different perspective and creativity in solving them (Bass, 1999).

Murphy and Drodge (2004) conducted a research to establish how the dimensions of transformational leadership as represented by the Four Is contributed towards the level of commitment, encouragement and motivation of the employees. The study was conducted on 28 police officers who responded to questionnaire beside the observation of the researcher at their site. The study concluded that the four I's contribute to the relational strength of the transformational leader that serve to elevate the levels of commitment, encouragement and motivation of the employees. The study had the limitation in that the sample of 28 police officers is small to be relied on for generalization. The study also combined the study of the four I's into one study which hindered an in depth review on each of the four Is. For future research, the study recommends that each of the four I's be studied on a separate study with recommendation of a wider sample.

Peng et al (2016) conducted an empirical study to establish the influence of CEO's intellectual stimulating behaviour of encouraging employees in bringing new perspectives and innovations and on employees' perception in regard to work. The study examined employees and CEOs from 43 firms which were classified as innovation driven industries Intellectual stimulation was measured using for dimensions: "Has stimulated me to rethink the way I do things," "has ideas that have challenged me to re-examine some of basic assumptions about my work," "challenges me to think about old problems in new ways," and "expresses appreciation when I think creatively". The study found out that rapid industry changes were directly related to positive relationship "between CEO intellectual stimulation and employee work meaningfulness." Further, the study found out that "CEO intellectual stimulation has a stronger positive association with employee work meaningfulness when the company is performing relatively poorly, or when the industry environment is more dynamic." The study was

limited in that the measures of intellectual stimulation consisted of generic statements about their leader. Further, the study's focus was on employees' work meaningfulness which may not be of prioritised focus by the management. It does not link to our study whose focus is how intellectual stimulation influences technological innovation. The sample used in this study was 43 CEOs of firms in China; this limits generalization for study in other parts of the globe. Future studies are recommended to consider impact of the other dimensions of the Four Is to the employee behavior.

Jaroliya and Gyanchandani (2021) conducted an empirical study to establish the role of transformational leadership on team performance in an IT department. The study was conducted on 354 individuals who work in an IT company in Pune. The researcher had questionnaires both for the leaders and for the followers where team leaders answered on team performance while the team members were required to respond on transformational leadership. Transformational leadership research instrument was MLQ (Multifactor Leadership Rater Questionnaire) which was launched by Bass (2000). The dependent factor was team performance while the independent was transformational leadership style. Regression analysis was used to measure the correlational relationship between the variables. The study found out that intellectual stimulation as part of the transformational leadership had a direct influence on the team performance. The limitation in the study was that the respondents may have a bias of just responding on positive feedback as for an opinion poll and withhold negative opinion. Further, the study did not evaluate other variances such as gender, age which may have influences on the performance of the leadership style. The data is also geographically limited to individuals in Pune creating opportunities for future research which would collect data across other companies and in different geographical areas.

Girardi and Sarate (2021) conducted an empirical descriptive study to analyse the employee's perception in a Brazilian financial organization in relation to transformational leadership amongst different groups of respondents. The study undertook independent review on how each of the transformational leadership four Is were perceived by the employees. The research distributed questionnaire to a sample of 603 employees in financial institutions in Brazil. The data which was statistically analysed found out that followers had high perception toward transformational leadership. The study found out that employees perceive a transformational leader with intellectual stimulation as one who as one promotes knowledge, impacts problem solving skills by provoking extra commitment to their work. The study was limited in that it studied perception which may be different from the actual leadership status. For future research other leadership style can be studied and also study presence of mediating factors.

From the reviewed empirical literature, there is consensus among scholars that intellectual stimulation as a key component of transformational leadership influences performance in an organization (Peng et al 2016; Jaroliya & Gyanchandani 2021; Girardi & Sarate 2021). However, few scholars have concentrated on the impact on intellectual stimulation on technological innovation and have concentrated on IT sector. The studies undertaken have also been geographically limited which hinders generalization of the results to other areas. This opens opportunities for future research on intellectual stimulation on technological innovation across various sectors.

4.3. Proposed Conceptual Model

The conceptual and theoretical literature review in the area of intellectual stimulation and technological innovation has highlighted various emerging knowledge gaps in the studies earlier conducted in the area. Further, this study seeks to propose a suitable theoretical model for advancing research and knowledge development in leadership. The study is developed around five constructs of intellectual stimulation: empathy, open communication, mentoring, servanthood and creativity relating in a mediating effect of conducive environment and moderating force of industry velocity for technological innovation. The model is summarized in figure 1

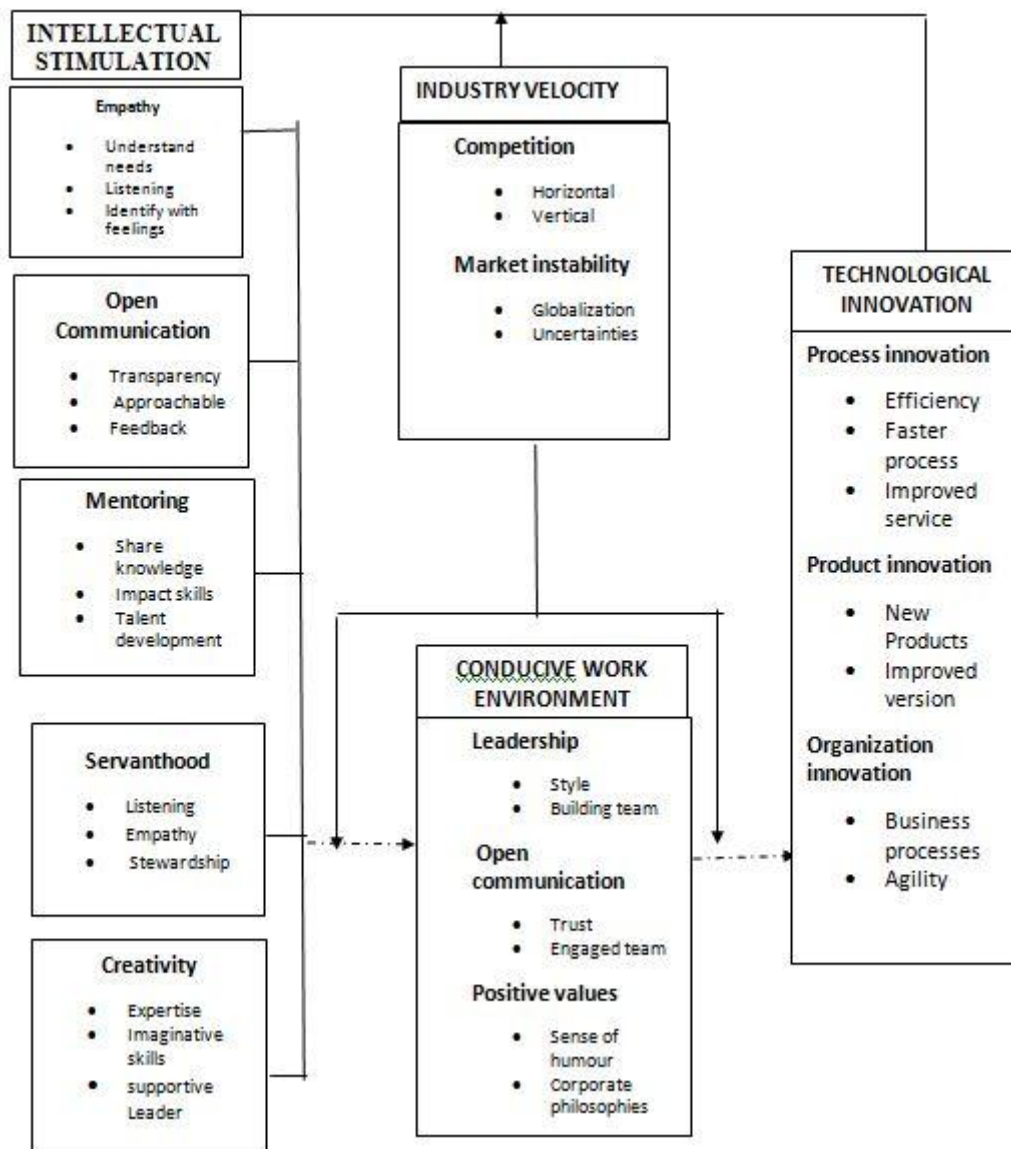


Figure1.0. Conceptual Framework

Source: Author

4.3.1. Intellectual Stimulation and Technological Innovation

The construct of intellectual stimulation as an element of transformational leadership has been associated with the creation of a favourable environment where creativity and innovations thrive in an organization (Jyoti and Dev, 2015; Ahangar 2009). The team members are inspired to use their distinctive and acquired skills to bring the best out of them for betterment of their organization. The employees are driven to inspiration by the need to surpass their set limits and get solutions to inherent challenges which results into better performance and thus position the organization at a competitive advantage.

Leaders who exhibit intellectual stimulation in their organizations are recognised as transformational in their leadership approach and are said to make team members to respond better to various situations and especially when they face various challenges at their work place (Tepper 2018). Whereas each individual has own task and duties, most organizations have embraced team and group work to take advantage of synergy in performance. It is in such working team and working environment that intellectual stimulation brings the best out of them (Avolio 2010; Jaroliya & Gyanchandani 2020). Based on this relationship, this study proposes as below:

Proposition 1: intellectual stimulation as part of transformational leadership will positively impact on the dimensions of technological innovation.

4.3.2. Role of Conducive Environment

Good working environment is an important factor in enhancing performance of teams and organization at large. It is the conducive environment created by the leadership, processes and the organizational culture that makes an organization to thrive in the midst of adverse environmental forces. The intellectually stimulating leader has been associated with creating an enabling environment for creativity and innovation. On the other hand, poor working condition hampers organizations from maintaining productivity and is an impediment to innovation and creativity. This construct has been associated with making it easier for leaders to introduce and grow innovative ideas in an organization (Ganapathi & Prasad 2008).

In high tech organizations and knowledge intensive firms, conducive working environment has been associated with the works of a transformational leader. Such an environment is further associated with subordinates' growth, improving the team morale and inspiring creativity and growth. The transformational leaders in these environments are recognised for improving the emotional balance of their followers and inspiring them to improve on the way they embrace creativity and technological innovations. The working environment thus becomes a crucial component in advancing technological resilience of the organization (Leipponen, 2008; Singh & Krishnan 2007). This leads to our second proposition:

Proposition 2: There is a correlation between intellectual stimulation and the conducive working environment in influencing technological innovation.

Proposition 3: Even though the presence of intellectual stimulation affects the growth of technological innovation, the magnitude of its effect is dependent on the availability of conducive environment.

4.3.3. The role of Industry Velocity

High velocity industry forces and highly dynamic markets have been associated with diverse influences and opportunities for creativity on product development and technological transformations in the organizations. The forces which are cyclic in nature makes the external environment to influence the organization towards high growth forces which are associated with high investments requirements (Zhou, Mavondo & Saunders 2018).

On the other hand, firms that are not sensitive to the dynamism in the market or that ignores the impact of industry velocity are bound to diminish in growth and may later become extinct. In some of the high dynamic markets, the rate of technological change and transformation is so high that market information is unavailable or becomes obsolete as fast as it jets in. In such market, the cost of ignorance is so high that a delayed strategic decision may lead to permanent dislodgement by the competition (Bourgeois & Kathleen 1988). According to Harrington, Lawton and Rajwani (2005), industry velocity is expressed in terms of market related instability such as shorter innovation and production cycles, shorter planning horizons and greater product multiplicity. In the modern contemporary environment, the industry velocity is further aggravated by issues such as global terrorism, unpredictable global market prices and localised political forces. The author further posits "Turbulence is an immense opportunity to move ahead, often in a transformational way" (p.37). This construct leads to our fourth proposition:

Proposition 4: Industry velocity mediates the relationship between intellectual stimulation and technological innovation.

Proposition 5: The mediating effect of conducive working environment on the relationship between intellectual stimulation and technological innovation will be moderated by level of industry velocity.

Proposition 6: The relationship between intellectual stimulation and conducive work environment is moderated by levels of industry velocity.

5. CONCLUSION

The objective of this paper was to review extant conceptual, theoretical and empirical literature so as to provide an understanding of the construct of intellectual stimulation and its resultant outcomes in technological innovation platform in an organization. It further proposes a corresponding theoretical framework suitable for demonstrating the relationships among identified constructs in the emergent

phenomenon. The construct was found to have key influence in organization's technological innovation, its performance and competitive advantage. Intellectual stimulation when strategically combined with conducive work environment creates a favourable environment for growth of creativity and technological innovation. The moderating role of industry velocity and dynamism on the relationship between intellectual stimulation and technological innovation has been expounded. The paper further brought out the conceptual relationship of the constructs in theoretical lens of transformative leadership theory, the diffusion of innovation theory and disruptive innovation theory.

The study encountered some limitations and constraints. Though the study was conducted based on an extensive review of conceptual and theoretical literature, they were drawn from few relevant disciplines. Thus, the author calls for broad multi-disciplinary approach with intent to enrich the extant knowledge in the area of intellectual stimulation and technological innovation. Further, from the literature review, the construct of intellectual stimulation is closely related to the other three elements of transformational leadership: Inspirational motivation, Individualised consideration and Idealised influence. This opens an area for future study where the role played by each of the Four I's is explored for broader understanding of the relationship.

In the current study, the construct of industry velocity is key in stirring need for technological innovations to keep afloat the competitive forces. Thus further empirical studies need to be conducted to establish how intellectual stimulation influences the leader's capability to stay afloat in a high velocity environment.

From the reviewed literature, there is consensus among scholars that intellectual stimulation as a key component of transformational leadership influences performance in an organization (Peng et al 2016; Jaroliya & Gyanchandani 2021; Girardi & Sarate 2021). However, few scholars have concentrated on the impact on intellectual stimulation on technological innovation and in the few have concentrated on IT sector. The previous studies undertaken have also been geographically limited which hinders generalization of the results to other areas. This opens opportunities for future research on intellectual stimulation on technological innovation across various sectors. Finally, the author recommends the need for an empirical study on the mentioned constructs which by providing factual data would validate the claims made by the proposition in this paper.

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