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Full Length Research Paper

Examining motivation theory in higher education among tenured and non-tenured faculty: Scholarly activity and academic rank

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The pursuit of tenure in higher education is arguably the dominant focus of tenure track faculty throughout the United States' higher education environment, if not a world-wide phenomenon. By applying Vroom's Expectancy theory of motivation, this study intends to investigate the relationship between research productivity and motivation to conduct such activities at higher education institutes by examining the academic productions of tenured and not tenured faculty members. This study sought to confirm the need to further investigate the impact that long-term job security, in the form of tenure, has on faculty academic productivity in higher education. The present study used the data from the 2004 National Study of Postsecondary Faculty (NSOPF) survey which suggested that there was a significant difference in the number of academic activities among faculty of different ranks and tenure status, especially among full and associate professors, and associate professors and assistant professors, regardless of their tenure status. However, the difference was not significant among the non-tenured full and assistant rank faculty. This may suggest that overall, among the sample population of this study, tenured faculty members were more actively involved in presenting scholarly products.

Key words: Faculty motivation, Vroom's expectation theory, expectation, valance, National Study of Postsecondary Faculty (NSOPF), tenure, rank, academic production, scholarly activity, faculty activity, higher education, higher education institute.

INTRODUCTION

This study intends to investigate the relationship between research productivity and motivation to conduct such activities at higher education institutes by looking at the scholarly academic activities of tenured and not tenured faculty members, using Vroom's Expectancy theory by considering the motivational value of both external and internal rewards as they relate to increasing the academic productivity of faculty. Vroom's theory is about mental processing regarding choices made in organizational behavior context and is based on an employee's belief; while the study of faculty motivation is not a new topic in the field of education (Darby and Newman, 2014; Hammond, 1994; Lee, 2014), unlike students' motivation factors, there has not been a

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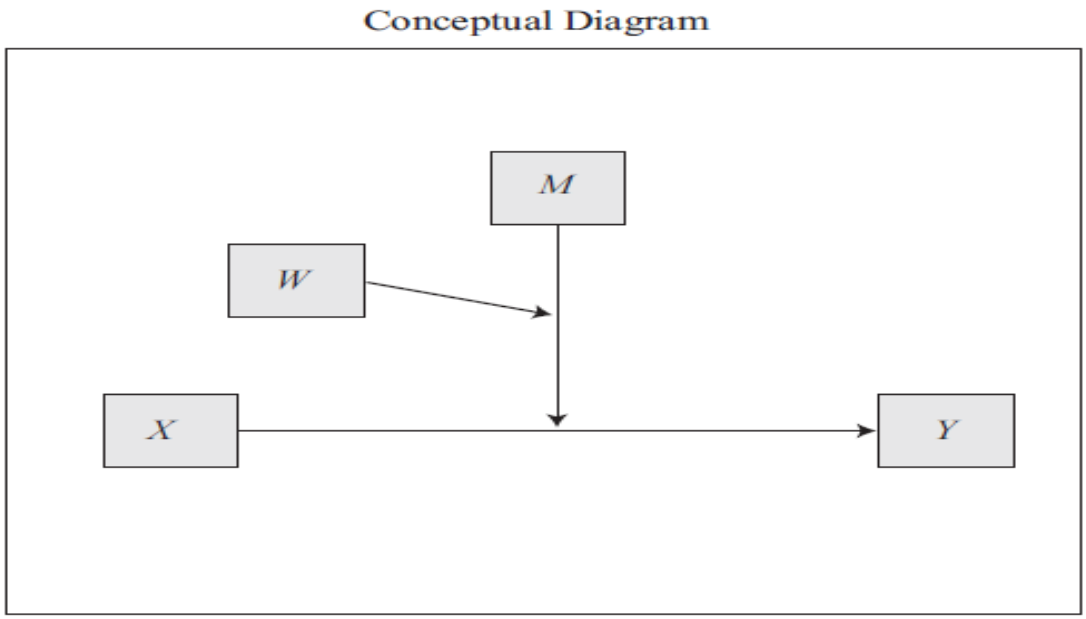

Figure 1. Moderation model of motivation and academic productivity as moderated by tenure and rank.

commensurate focus on the elements which affect faculty motivation at higher education institutes. Considering the above, a few studies have been conducted that have used Expectancy-Value Theory to examine the manner in which faculty engage in professional activities (Hardre et al., 2011; Hardre and Kollmann; 2012; Macdonald et al., 2014). Although these studies examined a wide variety of activities conducted by faculty, they all have illustrated that expectancy theory could be used to explain the actions and attitudes of faculty.

For instance, Hardre et al. (2011) investigated faculty motivational factors to conduct research across disciplines. They studied 781 faculty members at 28 research higher education institutes around the US and found that higher education institutes should promote and encourage faculty members' efforts since the support, which the institute provided was found to be the most significant predictor of productivity. Among the other findings of interest were (a) counting faculty productivity for tenure promotion is one of the strongest motivational factors among faculty, (b) institutions should invest in resources to provide the tools faculty need to conduct research and produce academically, (c) departmental support helped faculty gain self-efficacy and developed a "freedom of inquiry", and (d) that a heavy teaching load was the factor which negatively affected faculty's motivation to engage in research.

Chen et al. (2006) conducted a study using Vroom's 1964 expectancy theory to examine key factors that motivate faculty, using a total of 320 business faculty members at 10 universities. Their study concluded that both extrinsic and intrinsic motivation factors played equally in motivating faculty members to have higher research productivity. In contrast to tenure track faculty, they found that tenured faculty members are motivated more by intrinsic motivational factors, whereas non-tenured faculty responded better to extrinsic motivators such as rewards and an easier possible path to tenured status. In sum, they state that "research productivity is positively correlated with tenure status and the percentage of work time allocated to research activities and negatively correlated with years in academic employment" (p.185). Consistent with the aforementioned studies this study will look into all these factors (faculty's status, departmental support, and reward systems) to compare results with this study.

Theoretical model

The main purpose of this study is to find out whether or not a correlation exists between faculty status, academic production and motivational level. It is human nature to engage in activities, in order to reach desired outcomes and refrain from actions which result in unwanted outcomes (Bandura, 1986).

Although the motivation behind doing or not doing an action is not an unknown black box to researchers, it does not have a unified answer among different disciplines. It can be said that whether or not responding to individual needs or wants in life (Needs), people engage in certain actions (Behavior), which are pursued to have needs satisfied (Satisfaction); the action is either repeated or will allow moving on to the next action (Feldman and Paulsen, 1999). The theory used to drive this study is shown in Figure 1. This model states

that motivation (X) is hypothesized to predict productivity (Y), instructional rank (W) and tenure status (W) may predict productivity and may moderate motivation's relationship with academic productivity. As alluded to earlier, motivation will be conceptualized as being either intrinsic or extrinsic as defined by Vroom's expectancy model. Based on the Mediation model (Hayes, 2017), this study hypothesizes that faculty will report motivation to engage in academic productivity as a function of either being motivated extrinsically (rank/tenure) or intrinsically (sense of fulfillment) and that having either acquired tenure and/or rank will moderate the effect of these sources of motivation. In other words, academic productivity is a function of how faculty members view motivation and that faculty tenure and rank status moderates the effect of motivation on academic productivity, leaving motivation alone to explain some of the impulses behind the academic production of faculty. Here it is hypothesized that while motivation can explain some of the productivity of faculty, the power motivation has is mediated by whether they have tenure or not. Recent studies have found that there is small correlation between research productivity and faculty self-actualization (Pasupathy and Siwatu, 2014), and other factors such as department ranking, advisors' productivity, and length at the new job will have significant effect on faculty academic production (Runyan et al., 2013). Faculty internal motivation factor is counted as one of the most important intrinsic motivational factors which are also considered to be investigated in this study. Other scholars such as Miller et al. (2013) found that faculty who had been at the higher education institute longer, produced fewer publications. Miller and colleagues also found that factors such as grants and university funding, as well as multi-institutional research collaboration, and number of graduate students advised were incentives that had positive effect on faculty's drive to produce research (p. 526).

Motivation theories

Here, selected motivation theories are examined. Earlier theories, that is, Maslow's hierarchy of needs (Maslow, 1943) and Alderfer's ERG theory (Alderfer, 1969) are examined in detail. Each theory is explained and the limitations on each of the above-mentioned theoretical frameworks are also taken into consideration to justify why Vroom's Expectancy Theory would be the fit theory for the present study. In the next section, Vroom's Expectancy Theory, which is the theoretical framework for this study, is discussed in detail.

Maslow's hierarchy of needs

Maslow's hierarchy of needs is a human motivation theory in psychology proposed by Abraham Maslow. This theory was first brought up in his 1943 paper "A Theory of Human Motivation". Maslow has extended his idea to humans' innate curiosity; however, researchers and authors have criticized this theory as being irrelevant in most part of the world over the years (Jerome, 2013: 39). Yet Maslow's hierarchy of needs theory remains relevant in every sector of business today (Tischler, 1999; Boyatzis and McKee, 2006; Dailey et al., 2006; Subrahmanyan and Tomas Gomez-Arias, 2008). Maslow proposed a 5-level hierarchy, where the satisfaction of each lower level is a prerequisite to higher levels. According to Maslow's hierarchy of needs, there are the two lower order needs (physiological and safety needs) which in an institute may be linked to organizational culture. Every new organization may undergo this lower order stage to struggle with their basic survival needs. These needs are the strongest needs because if a person were deprived of all other needs, the physiological need would be the first needs a person would pursue in order to acquire satisfaction. On the second level of this hierarchy is the notion of safety, which is satisfied after all the physiological needs are met. The need for love, affection and belongingness is the third level of this hierarchy. This is when people develop a sense of belonging to the organization and are motivated to strive for the best since they are a part of a whole (Jerome, 2013: 42). This level corresponds with the formation of defined roles within an organization, getting it ready for the next level.

Needs for esteem is the fourth factor in Maslow's hierarchy which involve needs for both "self-esteem" and for the "esteem a person gets from others" along with feelings of respect from others as well as self-respect (Jerome, 2013: 41). In an organization, this is the role of human resource management (Botana and Neto, 2014; Jonas, 2016). Positive interaction of human resource management and the organizational culture is a factor which will result in employees' self-esteem and self-actualization. Such actualization can manifest in the employee's performance at work and ultimately the success of the organization. This stage marks or precedes the last level of this hierarchy, which is the need for self-actualization (Jerome, 2013: 42).

According to Maslow, the needs on the lower level must be fulfilled before the other needs are activated (Figure 2). However, here is where this theory encounters its limitations. In an organization, it does not make sense to assume employees would perform at their best during the day if they do not fulfill other needs such as going to the church on Sundays or not having adequate shelter. Thus, the theory is not backed by all researchers, and some even claim it makes the wrong prediction (Asgedom, 2017; Jones, 2014; Razak et al., 2017). Moreover, on other levels, Maslow's theory does not always clearly define what it is that a person wants when there is a need for self-actualization, not to argue the fact that Maslow fails to explain how self-actualization can

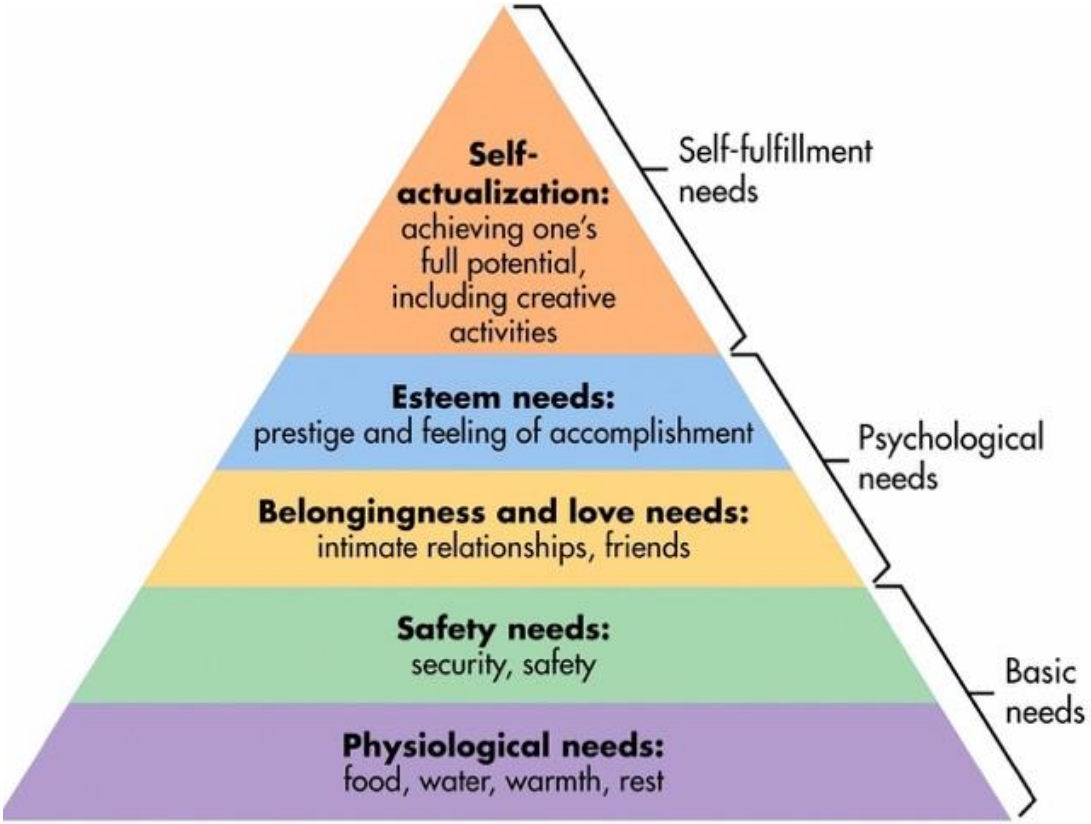

Figure 2. Maslow's hierarchy of needs model.

actually be a fundamental need or just something that can be done if one has the leisure time.

Alderfer's ERG theory

Similar to Maslow, Alderfer (1969) classifies needs into a hierarchy but condensed human needs to only three categories, which he first published in a 1969 article titled "An Empirical Test of a New Theory of Human Need." He believed that the more the needs on the higher levels are satisfied, human beings tend to pursue them more intensely. In this model, physical well-being (existence needs) needs are at the bottom of the hierarch providing basic material existence requirements. These needs cover the two levels of safety and physiological needs suggested in Maslow's model. The second level is relatedness needs, which is the desire people have to maintain important personal relationships.

These needs are satisfied by having social and status interactions, corresponding to Maslow's external component of esteem classification. Finally, the most concrete needs are growth needs, which determine development of competence and realization of one's potentials. Internal esteem and self-actualization impel a person to make creative or productive effects on himself and the environment (e.g., to progress toward one's ideal self). This includes desires to be creative and productive, and to complete meaningful tasks. However, Alderfer's theory goes further than simplifying the number of needs and broadening what each cover. Alderfer believed that although a general order for pursuing needs should be in place, this order is not as fixed as Maslow's hierarchy and priorities for each individual may change, depending on that person's need and the situation she is in. Therefore, according to Alderfer, motivation can be triggered differently in people and can be from more than one level and different from Maslow, is not linear as it may skip from one level to the other. In addition, Alderfer acknowledged the fact that the importance of needs is different from person to person, that is, for some people growth might have higher value than relationships at certain stages of their lives. One difference Alderfer's theory has from Maslow's hierarchy of needs is that Alderfer's model has a "frustration-regression" element which allows individuals to go back to pursuing lower level needs again if needs remain unsatisfied at one of the higher levels (Figure 3).

Taking into consideration all the factors mentioned above, Alderfer's model suggests that, similar to social choices people make every day, in the workplace not everyone is motivated by the same stimuli and not

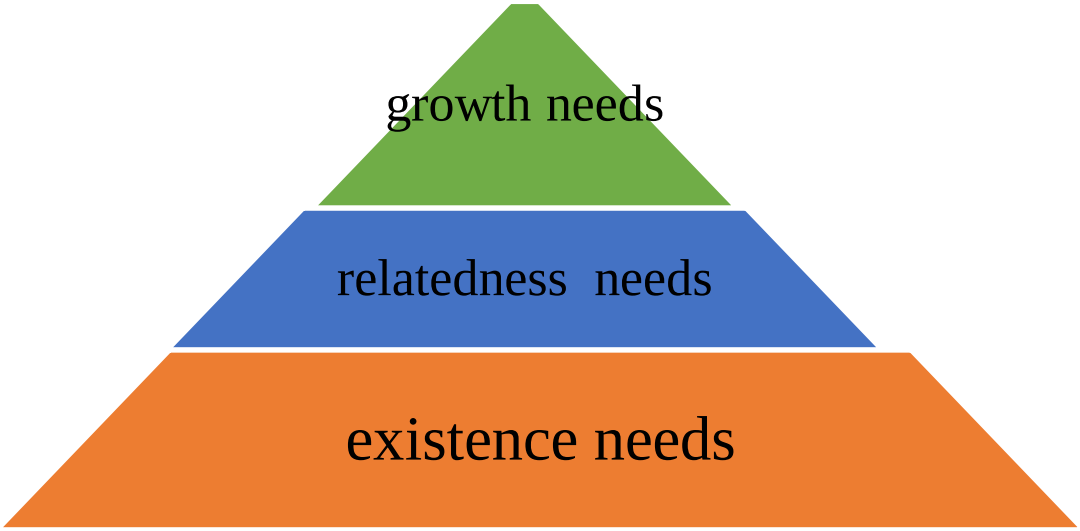

Figure 3. Alderfer's ERG theory.

everyone's hierarchy would look the same. As a result, individuals' needs probably mirror the organizational hierarchy to a certain extent. Meaning, that people who are in management positions or leadership roles would be more likely to be motivated by self-actualization/growth needs than existence needs. It is the role of the managers, administrative, and leaders at any workplace to recognize their employees' multiple simultaneous needs since focusing solely on one need at a time will not motivate people. The frustration-regression principle impacts workplace motivation.

Moreover, in the workplace, if employees are not provided with desirable growth opportunities by their management, they may regress to relatedness needs, and socialize more with co-workers. Therefore, it is again the role of the manager to notice such conditions in their onset, and take the appropriate steps to satisfy the frustrated needs of the employees until they are able to pursue growth again and ultimately contribute to the success of the organization.

Vroom's expectancy theory

Vroom's expectancy theory (1964) is different from other motivation theories such as Maslow's and Alderfer's, in the sense that Vroom's theory provides the cognitive process of variables according to individual differences in the work place rather than mentioning what exactly motivates members of an organization. Moreover, Vroom (1964) was the first scholar who developed an expectancy theory with direct implications in workplace settings based on employees' beliefs. In any work environment, people believe that there is a direct correlation between the effort they put into performing their best at work, the reward they receive from their hard work, and their final performance. As educational leaders who hold administrative positions, Vroom's expectancy theory can best explain motivating factors affecting employees by taking into account three main factors of "effort-to-performance expectancy, performance-to-reward expectancy, and reward valences" (Lunenburg, 2011a).

This practical viewpoint is based on four assumptions. One assumption describes people's motivation to joining an organization based on how they react to the organization considering their needs, motivations, and past experience. A second assumption focuses on individual conscious choices, which are people's own expectancy calculations. The third assumption is that each individual demand different things from the organization, such as job security and higher monetary compensation. The last assumption of Vroom is that people have the tenancy to pick alternative choices among available options in order to increase their personal outcomes. Vroom believed that motivation is the amount a person will be driven to do or not to do something depending on the situation they find themselves in. To sum up, Vroom's Expectancy Theory has three key factors: Expectancy (individual's estimate of the results of the job-related effort), Instrumentality (the extent an achieved task will lead to expected result(s)), and Valance (the reward of the archived task) (Vroom, 1964) (Figure 4).

Expectancy is the likelihood that a person will succeed on a given task, and it is associated with the risk that is intertwined with carrying out the task. If the task involves higher risk of failure, there will be lower motivation to invest in no chance of accomplishment. Surprisingly, the same will happen if the tasks involve low risk of failure. In

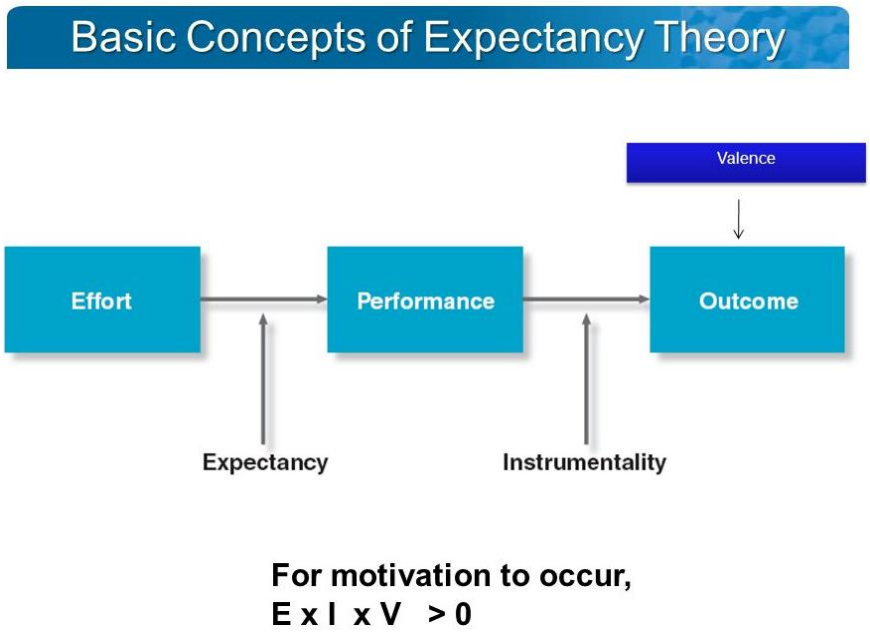

Figure 4. Basic expectancy model.

this instance, no significant result is foreseen and therefore the task would not be worth investing in. On the other hand, if there is only some risk involved with carrying out a task, there will be optimal motivation since success is likely in such task. In the first two scenarios, the doer of the task will experience failure identity associated with apathy, insecurity, and indifference, whereas in the later situation, the doer of the task will experience self-worth along with feelings of confidence, effort, and interest. At any task, the value that comes with accomplishment is the other important entity. The value may trigger intrinsic (personal) or extrinsic (social) factors. One may find a task worthy of accomplishment because of personal likes and dislikes, needs and drives, or to satisfy social approval, acquire status, power, or recognition. All above factors are intricately related and combined to influence the development of a goal.

In other words, according to Vroom's Expectancy Theory, when an individual indicated that he/she can do a task, Ability Beliefs and Expectancy for success will be differentiating factors which determine final achievement of the task (Eccles and Wigfield, 2002). Ability belief refers to "a person's current sense of competence in being able to complete a task" and expectancy for success is "how successful an individual believes he or she can continue to be in the future" (Macdonald et al., 2014: 76) which is the "expectancy" section of Vroom's Expectancy Theory. Furthermore, each task comes with a value, or as Eccles et al. (1998) categorized the factors of an individual's engagement, *intrinsic value, utility value, attainment value* and *cost*. The first three types of values influence an individual's desire to complete a task positively and has direct relationship between increases value and motivation, whereas the last factor, *cost*, is the negative aspect of engaging in a task.

There are first and second order outcomes in Vroom's Expectancy Theory. First order outcomes refer to results which are directly related to employees' behaviors, such as performance at work, showing creativity in doing one's job, being punctual and meeting deadlines, and representing oneself as a reliable individual at work. On the other hand, second order outcomes are any positive or negative result of the first order outcomes; e.g. while high performance at work would lead to the boss's praise and would result in salary increase; being tardy and not meeting project deadline may result in demotion and losing one's job security and acceptance by co-workers (Small et al., 2010).

Components of Vroom's expectancy theory

Expectancy

Expectancy is "a person's estimate of the probability that job-related effort will result in a given level of performance" (Lunenburg, 2011b: 127). In other words, in a workplace environment, employees' expectancy is fulfilled when there is probability that their effort will result in their ideal level of performance and, on the contrary, may not be satisfied if employees know that despite their effort, they will not reach the preferred outcome. It is the perception that "effort will result in performance" (Lunenburg, 2011: 127) and has a direct correlation with

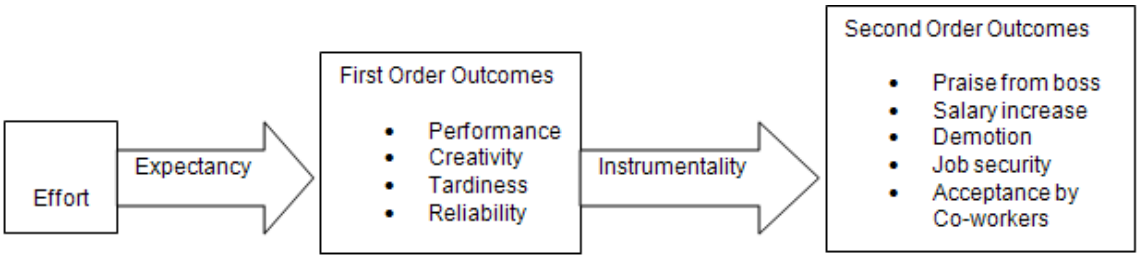

Figure 5. Small et al. (2010) first and second order outcomes.

performance. Hence, the value of expectancy resonates between 0 and 1. In this study the expectancy for non-tenured faculty is to gain tenured status by activity engaged in academic productivity. Efforts in this component will lead to first order outcomes.

Instrumentality

As with expectancy, instrumentality is a determining aspect in Vroom's Expectancy Theory ranging from 0-1. Lunenburg (2011: 127) defines this factor as "an individual's estimate of the probability that a given level of achieved task performance will lead to various work outcomes" (p. 2); if salary increase is always the result of good performance at work, the instrumentality of value is 1, and employees will put more effort to achieve that goal. Instrumentality, if the perception of employees about whether or not they will receive what they expected or desired from their effort. Likewise, in this study, tenured status always comes with the permanency status in the higher education institute setting. Instrumentality is a component of Vroom's theory which is perceived as the link between the first and second order of outcomes.

Valence

Valence is the last factor in Vroom's Expectancy Theory and is the reward employees receive as a result of good performance. It is the emotional orientation that employees have regarding the outcome of their effort at work. Going back to the previous example of instrumentality, the valence is that case is the salary increase. To sum up, "if the reward is small, the motivation will be small, even if expectancy and instrumentality are both perfect (high)" (Lunenburg, 2011, p.128). In the case of this study, job security is the valence, which is the value attached to the first and second order outcome. Vroom suggests that motivation, expectancy, instrumentality, and valence are related to one another by the following equation:

Motivation = Expectancy x Instrumentality x Valence.

Vroom's expectancy theory was later expanded and refined by Porter and Lawler (1968) and others (Pinder, 1987) (Lunenburg, 2011: 127). Figure 5 depicts the first and second order outcomes according to Small et al. (2010).

Academic productivity- factors related to faculty motivation

This study seeks to investigate the correlation between research productivity and motivation to conduct such activities at their higher education institutes by looking at the academic productions of tenured and not tenured faculty members at different academic ranks. Therefore, in this section previous studies on both external and internal factors related to faculty motivation and the relation between pre/post tenure and productivity are summarized in order to reach an in-depth analysis of possible correlation between faculty status and academic production.

Extrinsic factors

It has been found that the extrinsic motivation factors which can affect faculty academic productivity usually come from institutional expectations. Other scholars like Goodall et al. (2014) believe that administration plays a role in faculty academic production. Specifically, they looked at 169 chairpersons in 58 US university departments over 15 years with the hypothesis that chairpersons' research interest, characteristics and their previous research do impact the future of the research done in the departments and can be a predictor of improved research performance of the faculty.

Particularly, Goodall et al. (2014) focus on the fact that research at higher education institutes "involve multi-university collaboration and are ever more geographically dispersed" (p.30). They concluded that since faculty often has broader mission than pure research at their higher education institute, the quality of management by the academic departments and the chairs affect the level of

academic research and teaching performance.

Moreover, the same study points out that other researchers such as McCormack et al. (2013), and Beerkens (2013) looked into the effect of the department chairs and administration and came up with the same conclusions about their role at higher education institutes in the UK and Australia respectively. Specifically, McCormack et al. (2013) found that "incentives for staff recruitment, retention and promotion, are correlated with both teaching and research performance conditional on resources and past performance" and Beerkens (2013) found that "management practices indeed seem to have some positive effect on research productivity" (p. 18).

Longitudinal studies such as Goodall et al. (2014), which looked at higher education institute at the administrative level is a good reference to the present study since it looked at the academic productivity of university leaders and its correlation to faculty productivity. They concluded that "presidents with higher levels of life-time citations were associated with universities that went on to perform the best" (Goodall et al., 2014: 5). The nature of Goodall et al. (2014) study supports the validity of this claim and was cross checked with other longitudinal studies such as Jones and Olken (2005). Goodall (2014) concluded that "….it is the Chairs' citation that seems to matter…" (p. 12), and not their publications per se. In addition, "…the departments which are better managed also demonstrate better performance in both research and teaching" (p. 13). Last but not least, Goodall (2014) found that "scholar-leaders may find it easier to recruit and retain other top scholars" (p. 13), which is one crucial point to consider as a leader in a higher education institute.

Tien (2000) examined faculty motivation to perform research using the expectancy theory and found that among the studied population, faculty members who had higher motivation to gain promotion showed more desire to conduct research. Moreover, the nature of the reward offered to faculty in exchange for higher research performance also determined the degree they were interested in conducting research. Therefore, the bigger the reward offered, that is, the stronger the extrinsic factor, the higher faculty tended to conduct research and endeavor for the best. Tien used Taiwanese faculty survey data and concluded that faculty who wanted to accomplish personal income advancement and seek national grants was more motivated to publish articles and books. She furthered her findings in that different rewards offered by higher education institutes have different effects on faculty research performance. Although both intrinsic and extrinsic rewards motivate faculty research, faculty at different ranks reacts to these factors differently according to the career state they are in. Moreover, she found out that when faculty considers a particular reward significant, and/or that factor plays a role in faculty rating, it will promote faculty to meet the standard regardless of the nature of the reward.

Therefore, if the higher education institute considers academic production as a means to accomplish rank advancement, faculty will be more active in publishing and other academic activities. Lastly, she found that promotion had the highest valance effect on faculty and can best predict faculty productivity.

Bowers and Ryan (2013) studied the tenure and rank advancement standards for University of Alaska at Anchorage and University of Texas at Arlington. In their study, they investigated the standards at these two different university systems by considering value, culture, and philosophical system as their variables. They found that besides the university standards and their academic productions, what the faculty really cared about was their peers' review.

Intrinsic factors

Unlike extrinsic motivation, intrinsic motivation factors are influenced by the faculty's personal reasons. Earlier research, such as Fox (1983) took into consideration three major factors (individual-level characteristics, environmental location, and feedback process of cumulative advantage and reinforcement) in faculty productivity and motivation to conduct research. Fox concluded that individual-level characteristics, factors such as psychological characteristics, work habits, and demographic characteristic, that is, intrinsic factors are the strongest determiners of faculty research productivity. Recently, Bland et al. (2005, 2006) has designed a comprehensive theoretical model called the Bland model which explains faculty research productivity in relation to three characteristics and groupings of individual, institutional, and leadership. In this research, the factors influencing faculty research productivity have been studied and it was concluded that all three factors mentioned above are influential in faculty productivity. According to this model, both intrinsic (individual) and extrinsic (institutional and leadership) factors play crucial roles in faculty productivity; however, external factors may be in some cases more powerful.

Another intrinsic factor introduced by Shollen et al. (2014), is the presence of a "mentor" figure during research. They examined the relationship formal and informal mentorship has on faculty and the satisfaction that faculty receive as a result of this relationship. Since productive faculty is not necessarily happy faculty, the goal of their study was to examine the effect of mentor relations and see how satisfied faculty is. For the population of this study, the intrinsic motivation mentorship developed for them, played a key role in higher academic activity. They concluded that among the 615 faculty they studied, both forms of mentoring- formal and informal- did make positive impact on faculty enthusiasm for conducting research.

Cerasoli et al. (2014) presented the results from a

40-year longitudinal study of more than two hundred thousand faculty, hypothesizing that both extrinsic and intrinsic factors can influence faculty academic and non-academic performances. However, through a meta-analytic regression, they concluded that unlike some studied, that intrinsic motivation factors were the strong predictor of faculty performance. The relation between intrinsic motivation and performance, when incentivized, was stronger for indirectly performance-salient incentives than directly performance-salient incentives, that is, individuals who enjoy their job, outperform those who do not, regardless of any external incentives. Although, when present, incentives do play a contingency role in performance, still intrinsic motivation has to exist for the faculty to perform and produce academically and incentives alone have little correlational impact on faculty performance. Therefore, despite the significance of both intrinsic and extrinsic motivation factors, intrinsic factors overall remain a better predictor of faculty performance.

Tenure status

Relationship between pre- and post-tenure status and academic productivity

As it is noted by this point of the research, this study looks into the academic production of faculty members' pre- and post-tenure at higher education institutes. Hence, the tenure process is also considered in the present research. Since this study intends to focus on the leadership aspect of higher education and seeks to explore the concept of tenure among faculty members at higher education institutes, the notion of higher education leaders' decision making and the effect on their institute is also taken into consideration. Although the notion of "publish or perish" has been associated with the pressure in academia and is a determiner of academic success to the extent one's career may suffer as a result of not having regular research outputs. This notion of publish or perish has been in the literature from the 1940's and there have been a lot of studies with this focus. Several researchers (Neumann and Finaly-Neumann, 1991; Parchomovsky, 2000; Gray and Birch, 2001; Lee, 2014) all studied this notion and reached similar outcomes. Their findings support the idea that faculty often believe that if they do not publish their work, they will perish, which has increasingly caused anxiety and induced stress among not only young academics but also more established scholars. Therefore, higher education leadership can respond to faculty's concern by helping faculty increase their scholarly productivity in different ways and recognizing all kinds of academic product other than research, such as presentations at national conferences and smaller publications. Research shows that faculty is more productive if they write daily, use key sentences to organize their writing around, and periodically receive constructive and broad feedback on their drafts from peers. These solutions can also encourage faculty increase their productivity.

In another study, Von Solms and Von Solms (2016) looked at the tenure process as an assessment to determine whether a faculty member will or will not be granted this status at the higher education institute. Renowned higher education institutes like Oxford, which is second on the world rankings according to Times Higher Education (2016), encourage faculty to promote their work through publishing; therefore, publishing is regarded as a means to secure faculty's reputation in the academic world and give them job security.

In a more recent study, Miller et al. (2011) examined the pressure to publish universities and colleges put on both tenured and tenure-track faculty and found that, although the pressure may seem more on the latter group, both groups feel this pressure. But what is significant about this study is that it is the faculty themselves that add to this pressure, since they see publishing and academic productivity as a means to gain job security, increase salary, and job mobility.

Hardre and Kollmann (2012) similarly noted that the low-quality performance of faculty can be the result of a mismatch between the institution versus faculty's goals and values. They studied faculty motivational factors in 60 academic departments in research universities and found eight key features of employee engagement, effort, persistence, innovation, and organizational commitment to be the strongest elements affecting faculty performance. They suggested that these factors should be taken into consideration in faculty standards from the beginning and at the time of faculty evaluations.

In their study of 104 management departments of the Association to Advance Collegiate Schools of Business International (AACSB) accredited, research-oriented US business schools, Miller et al. (2011) considered the pressure to publish among all faculty. Their results indicated that both tenured and tenure-track faculty were trying hard to publish; however, the non-tenured faculty was more motivated to accomplish their goal in order to enhance "their professional reputation, leaving a permanent mark on their profession, and increasing their salary and job mobility. "On the other hand, the pressure to publish affected the faculty negatively and heightened their stress levels and resulted in "marginalization of teaching" and conducting "research that may lack relevance, creativity, and innovation." Therefore, it is the responsibility of the administration to lower faculties' stress level by heightening satisfaction levels at higher education institutes. The power of leadership to ameliorate the negative consequences of the need to conduct research has been argued as Waltman et al. (2012) looked at faculty members' satisfaction and dissatisfaction factors among 220 non-tenure tracked faculty members (NTTF); it is found that the administration plays a significant role in faculty

satisfaction and can help by “supporting their teaching efforts, enacting policies that promote job security and advancement opportunities, and creating inclusive climates” (p. 431).

The higher education industry has been subject to several fundamental challenges like some other nonprofit and for-profit industries. Pucciarelli and Kaplan (2016) have done a comprehensive research on the matter and conclude that faculty who do not produce research and are not as active in conducting studies may face some uncertainties at their higher education institute.

Previous studies using NSOPF data

The present study used the data from the 2004 National Study of Postsecondary Faculty (NSOPF) survey. The National Center for Education Statics has developed, validated, and piloted the National Statistics of Post-Secondary Faculty (NSOPF) survey first in the 1990s to gather data on faculty and instructors at higher education institutes; it was conducted in response to a continuing need for data on faculty and instructors - persons who directly affect the quality of education in postsecondary institutions. Faculty is the pivotal resource around which the process and outcomes of postsecondary education revolve. They often determine curriculum content, student performance standards, and the quality of students' preparation for careers. Faculty members perform research and development work upon which this nation's technological and economic advancement depends. Through their public service activities, they make valuable contributions to society. For these reasons, it is essential to understand who they are; what they do; and whether, how, and why they are changing. This study was designed to provide data about faculty to postsecondary education researchers, planners, and policymakers. NSOPF is the most comprehensive study of faculty in postsecondary educational institutions ever undertaken. This set of data has been used in a number of studies to determine faculty motivation at different levels and with various variables (Toutkoushian and Conley, 2005; Finkelstein et al., 2013; Webber and Tschepikow, 2013; Schimpf and Main, 2014; Kezar and Maxey, 2014; Webber, 2012; Faircloth et al., 2015; Milkman et al., 2015; Warshaw et al., 2017).

In 2002, Conley and Leslie used NSOPF-93 data to find out who part-time faculty is, what are their needs, and what motivates them in their carriers. They had five major findings. They found that part-time faculty are mostly female, have a full-time position somewhere else, believe they received less institutional support, there were more part-time positions in fields such as humanities than other areas. Most importantly part-time faculty members had different motivations for being part-time employees such as personal preference or lack of full-time position availability and the fact that most part-time faculty were also finishing their degrees (p. 8).

Zhou and Volkwein (2004) examined the NSOPF-99 data to determine the factors influencing tenured versus non-tenured faculty departure from higher education institutes. They concluded that for both groups, “seniority, satisfaction with compensation, satisfaction with job security, compensation, external extrinsic reward, academic rank, minority status and doctoral degree” has the strongest direct effect on departure intention for faculty (p. 153). They also found that faculty who had been with their higher education institute for a long time and are considered senior faculty, are less likely to leave where they work. Moreover, the notion of job security was more important to non-tenured faculty, which can conclude that tenure status comes with the feeling of job security for faculty. However, tenured faculty may leave the institute if they receive higher monetary compensation from elsewhere; but non-tenured faculty tend to stay at the same institute in hope of getting tenured and may often turn down a higher salary job offer from another institute. Among these interesting findings, Zhou and Volkwein (2004) said the most interesting of all was that academic rank has a different impact on non-tenured versus tenured faculty. While non-tenured faculty “with higher academic rank appear to be more mobile and interested in leaving”, for tenured faculty rank advancement meant “job security and indirectly reduces their departure intention” (p. 18).

In a more recent study, Mamiseishvili and Miller (2010) compared the NSOPF-99 and 2004 data to find out which group of faculties (tenured or non-tenured) should be awarded a sabbatical leave opportunity by exploring questions related to faculty participation in sabbatical leave programs. They concluded that sabbaticals are employed more as a reward for past performance, service, and scholarly achievement rather than as a developmental strategy to help faculty improve, which could be interpreted, that full-time, tenured faculty are the only group benefitting from such opportunity (p. 16). Using the same set of data, Mamiseishvili (2010) in a separate study looked at the NSOPF 2004 data on female faculty focusing on their country of birth (foreign-born vs. US-born) and their work roles and productivity; it was found that foreign-born faculty were more engaged in scholarly activities than their American counterparts but were less active in teaching roles (p. 149). The study left the findings there and did not expand on the idea of scholarly productivity of all faculties and their tenure status.

Antony and Hayden (2011) used the NSOPF:2004 data to examine factors correlated with job satisfaction among part-time and full-time faculty members at both two-year and four-year institutions and among male and female employees. They found that part-time faculty members were equally satisfied with all aspects of instructional duties, reward, and their amount of workload, leaving to conclude that there were no apparent significant

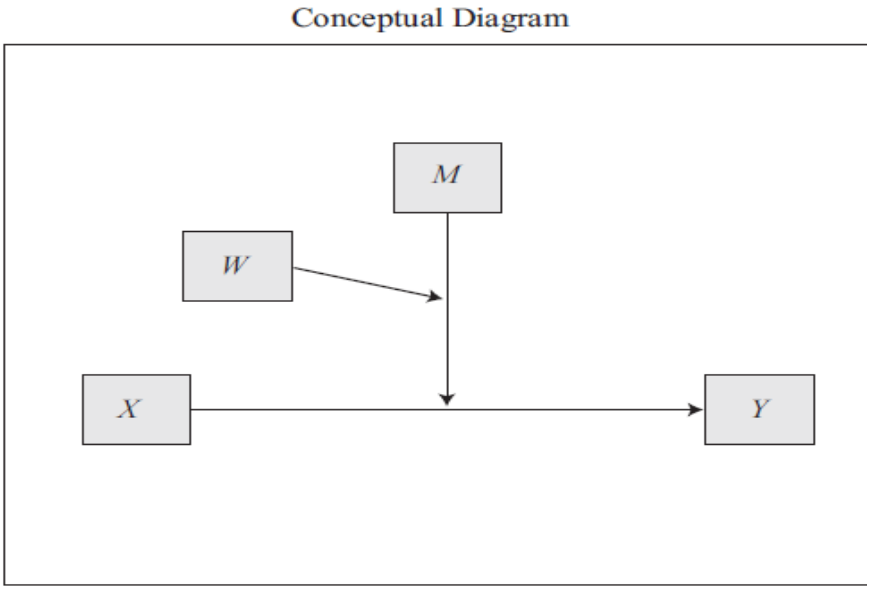

Figure 6. Conceptual path diagram of moderation effect.

differences in job satisfaction among male and female part-time faculty members at both two and four-year institutes. On the other hand, in their study about variables that predict job satisfaction, Akroyd et al. (2011) found that that regardless of gender, the most positive predictors of faculty satisfaction were instructional autonomy and time spent on disciplinary activities, and if there was a prospect of salary increase, faculty members were satisfied with their current income. However, the only difference in gender came when female faculty in education disciplines showed more job satisfaction than their female peers in occupational areas. Lastly, investigating about race revealed that white men had the tendency to be less satisfied with their job than men of color.

In the research done for this study, the researcher did not find a study that directly addresses faculty scholarly activity of tenured and non-tenured faculty using this set of data. Also, none of the studies have used the NSOPF data to interpret this matter in such broad scale. It is hoped that this study, shed light on such pivotal matter and the implementations of the findings of this study guide higher education leaders and administrators in better improving their organizations towards academic excellence.

In short, Vroom's Expectancy theory was selected as the preferred theoretical framework. As mentioned, Vroom's Expectancy Theory can explain why faculty members at higher education institutes engage in academic production when they have a series of alternatives available to them. This theory takes into account extrinsic factors such as salary raise, grant allocation, and the focus of this study, that is, acquiring tenured status, as well as intrinsic factors such as institute appreciation/recognition/award and acquiring the feeling of self-actualization and self-worth. Promoting faculty belief that an increase in academic production effort will result in an increase of the possibility to accomplish any of the factors (extrinsic and/or intrinsic) above is critical to higher education institutes' leadership.

One of the hypotheses of this study is that pre-tenured faculty members are driven by the strong extrinsic factor of acquiring tenured status to engage in academic activities and more inclined to intrinsic motivators after gaining tenured status. Hence, non-tenured faculty tenured status (expectancy), by engaging in academic productivity (instrumentality) and non-tenured faculty is inclined to have higher academic productivity to gain the job security (valence) through tenure status since it usually comes with a permanency in status at higher education institutes. On the other hand, tenured faculty members are expecting reinforcement of their position (expectancy), to gain leadership acknowledgement and/or self-actualization (valance) through academic productivity (instrumentality). This study looks at the academic production of the faculty members participating in the 2003–04 National Study of Postsecondary Faculty (NSOPF:04). This sample included 1,080 public and private not-for-profit degree granting postsecondary institutions and covered 35,000 faculty and instructional staff.

Model specification

Figure 6 depicts the researcher's conceptual diagram for this study: (1) a relationship exists between motivation factors and academic productivity of faculty, and (2)

tenure and rank status have a moderating effect on the relationship of motivation factors and academic productivity of faculty members. The model depicts the hypothesis of this study that relative to the degree of the perceived effectiveness of tenure and rank advancement, faculty members are motivated to have more academic productivity. Overall, Figure 6 illustrates that being motivated influences academic productivity; however, the presence possibility of achieving tenure status and rank exacerbates this effect.

Design

This study employed a non-experimental, explanatory correlational research design using archival data to examine the association among higher education faculty academic productivity, the motivation factors affecting the number of academic activities, and status as tenured vs. not-tenured faculty. Used frequently in educational research, ex-post facto correlational research incorporates the use of pre-existing data to identify whether, and to what degree, an association exists between two or more quantifiable variables (Gay et al., 2001), by assigning subjects to different groups (tenured vs. non-tenured faculty). In correlational research, variables are related and measured, not manipulated (Creswell, 2002). Correlational studies, more specifically relationship or explanatory studies, often investigate a number of variables hypothesized to be related to a major variable, such as career longevity or career decisions in this study (Gay et al., 2001). This case study did not intend to determine a causal relationship between the variables but rather attempted to find a relationship between motivation, tenure status, and academic production of higher education faculty.

Variables

In the present study, the number of academic production done by faculty by both tenured and on-tenure-track-but-not-tenured-yet is examined, considering rank as the dependent variable and motivation among permanent/tenured higher education faculty as the independent variable or central interest. The variables in this study include motivation factors, tenure status, rank, and academic production of higher education faculty members. Path analysis tends to avoid the use of the terms independent variable (IV) and dependent variable (DV) since a variable can actually act as both an IV and DV depending on the hypothesized causal relationships (Meyers et al., 2013; Norman and Streiner, 2003). Instead, path analysis uses the terms exogenous and endogenous variables. Conceptually, an exogenous variable is the independent or predictor variable that is hypothesized to influence the endogenous variable, which is the outcome, criterion or dependent variable (Meyers et al., 2013; Norman and Streiner, 2003). An exogenous variable has an arrow pointing from it to the endogenous variable to illustrate its hypothesized influence on the endogenous variable. Furthermore, exogenous variables do not have any arrows pointing to them since their causes are not included in the model, and endogenous variables will have at least one straight arrow pointing to them (Norman and Streiner, 2003; Streiner, 2005). The study seeks to answer the overall hypothesis that when faculty members gain permanent/ tenured status, their academic production, which is an indicator of motivation, decreases.

Motivation factors

In this research, both extrinsic and intrinsic factors influencing faculty research productivity determined by the survey questions have been studied. As formerly mentioned, extrinsic motivation factors which can affect faculty academic productivity usually come from institutional expectations, where intrinsic motivation factors are influenced by the faculty's personal reasons.

McCormack et al. (2013) and Beerkens (2013) looked into the effect of the department chairs and administration and came up with the same conclusions about their role at higher education institutes in the UK and Australia respectively. Specifically, they found that "incentives for staff recruitment, retention, and promotion, are correlated with both teaching and research performance conditional on resources and past performance"; Beerkens (2013) found that "management practices indeed seem to have some positive effect on research productivity" (p 18). Therefore, it would be fair to investigate the responses to the questions regarding the role of administrators and chairs in the academic productivity of the faculty members in the 2014 National Study of Postsecondary Faculty (NSOPF) survey.

Although external factors such as monitory incentives, scholarly activities of administrators and chairpersons, as well as workload and time spent on different job-related activities do play a contingency role in performance, intrinsic factors related to the study, that is, time spent on not job-related activities at the workplace, overall job satisfaction, and faculty opinion of the higher education institute has to exist for the faculty to perform and produce academically; incentives alone have little correlational impact on faculty performance. Therefore, despite the significance of both intrinsic and extrinsic motivation factors, one of the hypotheses whether or not the present study is that intrinsic factors overall remain a better predictor of faculty performance.

Tenure status

Tenure status is a binary variable in this study. The study is looking at faculty academic productivity pre- and

post-tenure status. This variable is one determined by the higher education leaders' decision and affects the institute. In the NSOPF 2004 survey, the questions related to tenure status are among one of the first questions. The questions related to tenure status is administrated to all faculty and instructional staff and pertain to whether faculty and instructional staff have tenure status or are on tenure track status, the year tenure was attained, and whether non-tenured faculty and instructional staff would prefer holding a tenure track position.

Rank

Academic rank is the second moderating variable considered in the model. Rank was selected as a potential moderator as research suggests that rank is a factor in the academic productivity of faculty (Carr et al., 1992; Englebrecht et al., 1994; Tien and Blackburn, 1996). Previous research has shown that rank is correlated with productivity, with the Englebrecht et al.'s study showing the associate rank faculty having the highest productivity when the date of the promotion is considered. Gender and other personal characteristics were not considered, as previous research has shown that these attributes were not found to be of consequence relative to academic productivity (Sax et al., 2002).

Academic productivity

In this study, the terms "Academic Production" and "Scholarly Achievements" are interchangeably used to refer to any academic activity done by faculty regardless of their status. These activities are as follows, but not limited to: conducting research (clinical, descriptive, correlational, quasi-experimental, experimental, etc.), writing papers, presenting at local and inter/national conferences, grant proposals, community engagement activities related to the higher education institutes, etc.

In the NSOPF 2004 survey, there is a section administered to all faculty and instructional staff on "scholarly activities". The survey identifies scholarly activities as articles published in refereed professional or trade journals; creative works published in juried media; articles published in non-refereed professional or trade journals; creative works published in non-juried media or in-house newsletters; published reviews of books, articles, or creative works; or chapters in edited volumes, textbooks, other books; monographs; research or technical reports disseminated internally or to clients; presentations at conferences, workshops, etc.; exhibitions or performances in the fine or applied arts; and patents and computer software products related to faculty and instructional job standards and their overall career two years ago.

METHODOLOGY

Population

The NSOPF survey was administered as a web-based instrument targeting faculty and instructional staff holding different ranks, backgrounds, and academic status. The NSOPF 2004 survey was first conducted in 1987-1988 with a sample of 480 institutions (including 2-year, 4-year, doctorate-granting, and other colleges and universities), ranging from more than 3,000 department chairpersons to over 11,000 instructional faculty. The response rates for the three surveys were 88, 80, and 76 percent, respectively. This survey was then replicated in a 1992-93 study with an expanded sample of 974 public and private not-for-profit degree-granting postsecondary institutions and 31,354 faculty and instructional staff. The response rates for the two surveys were 94 and 84 percent, respectively. The 1998-99 National Study of Postsecondary Faculty (NSOPF:99) included 960 degree-granting postsecondary institutions and an initial sample of faculty and instructional staff from those institutions. Approximately, 28,600 faculty and instructional staff were sent a questionnaire. The 2003–04 National Study of Postsecondary Faculty (NSOPF:04) included a sample of 1,080 public and private not-for-profit degree-granting postsecondary institutions and a sample of 35,000 faculty and instructional staff. The weighted response rates for the two surveys were 86 and 76 percent, respectively.

Sampling and procedure

After acquiring the proper IRB approval from Fayetteville State University, the researcher will contact the office of IES Data Security office at the U.S. Department of Education/IES/NCES to acquire the data on the NSOPF 2004 Faculty survey. The data can be accessed online through the National Center for Education Statics (NCES) data lab or the raw data can be released to a full-time employee with a doctorate as a Principal Project Officer (PPO). NCES only accepts restricted-use data license applications and amendments through its Electronic Application System (EAS). Any license application that does not come through this system will be returned to the applicant. The EAS protects individually identifiable information from disclosure and explains the laws and regulations governing the NSOPF data in general.

Upon acquiring confirmation from the of IES Data Security office at the U.S. Department of Education/IES/NCES, the PPO will be provided with a license number and the PPO's email address to generate a link to the license. The EAS is a system to submit a formal request and for the IES Data Security Office to conduct a review of the researcher's request. The researcher is responsible for submitting all completed and signed license documents, security plan form, and affidavits of nondisclosure in hard copy to IES after receiving an initial review of the online formal request. He must abide by all the terms and provisions in the license and the security plan to prevent the restricted-use data from being removed or telecommunicated from the Licensee's secure project office, which will be considered a class E felony and subject to imprisonment for up to five years, and/or a fine of up to $250,000.

The IES Data Security Office will generate restricted CD's which do necessarily include all of the derived variables that are in the public use or the older Data Analysis System (DAS). However, restricted license holders can obtain selected derived variables in a raw format on request, which can be acquired upon submission of a list of derived variables to the IES Data Security Office, together with the license number and the preferred file format. An IES contractor will then create the file and send it to the IES Data Security Office for dissemination. There are two ways to analyze the acquired data, either through the NCES online tools or to use SPSS. The NSOPF data have been used in several studies

(Toutkoushian and Conley, 2005; Finkelstein et al., 2013; Webber and Tschepikow, 2013; Schimpf, and Main, 2014; Kezar and Maxey, 2014; Webber, 2012; Faircloth et al., 2015; Milkman et al., 2015; Warshaw et al., 2017; Conley and Leslie, 2002; Zhou and Volkwein, 2004; Mamiseishvili and Miller, 2010; Antony and Hayden, 2011; Akroyd et al., 2011); hence, this instrument has high validity and reliability and therefore the researcher did not conduct a pilot test to determine the validity and reliability of the National Study of Postsecondary Faculty (NSOPF:04) survey.

Instrumentation

The National Center for Education Statics (NCES) has developed, validated, and piloted the National Statistics of Post-Secondary Faculty (NSOPF) survey first in 2004 to gather data on faculty and instructors at higher education institutes. The last two sections of this chapter deal with the threats to validity and the ethical procedures taken in collecting, interpretation and analyzing the data gathered in the process.

Data analysis

To begin to understand the relationship among the variables presented in this model, descriptive statistics for faculty academic productivity, tenure and rank status, and motivation factors were generated. The researcher ran exploratory analyses to understand the nature of the association between variables. The means, standard deviations, and Pearson product-moment correlations for self-efficacy and perceptions of tenure and rank status (predictor variables) were calculated to determine what relationships existed between them. The mean was determined for future scholarly activity involvement.

In order to generate descriptive statistics, the data were transformed from categorical to continuous. To facilitate the analysis, responses from each survey instrument were aggregated by taking all of the scores from all items on each individual scale and developing one score for each participant for each survey. As mentioned previously, external and internal motivation factors and faculty tenure and rank status are considered categorical variables; however, they were analyzed using continuous statistics in this study. Therefore, each participant's score on whether they held tenure status or not was determined by collapsing all scores into one continuous score. Similarly, the continuous score for each participant on the motivation factors was determined by taking an aggregate of the responses for each participant.

Path analysis and moderation

The purpose of path analysis is to generate estimates of the strength and significance of hypothesized causal relationships between variables (Norman and Streiner, 2003). Path analysis techniques explore the effects between variables. In path analysis, the relative sizes of path coefficients will be represented in an output path diagram. A path coefficient is a standardized regression coefficient determined by running regression analyses.

In this case, moderation analysis, a specific model of path analysis, was used. As mentioned previously, moderation analysis examines the relationship between three or more variables where the presence of a specific variable is said to moderate or alter the relationship among two or more variables, depending upon the design, using regression-based analytics (Hayes, 2017). The moderator describes the "strength and direction of the causal effect of the focal independent variable (e.g. treatment) on the dependent variable" (Wu and Zumbo, 2008: 379). Consequently, moderators are referred to as auxiliary variables due to their enhancement of the hypothesized bivariate causal relationship. Moderation techniques determine how a third variable (Mo) affects the relationship between a predictor variable and an outcome variable.

Regression model

In order to describe the networks of relationships that exist among several variables and to understand how constructs influence one another, multivariate analysis is required (Wu and Zumbo, 2008). Therefore, this study used multivariate analysis based on multiple regression to perform a path analysis, more specifically, moderation. According to Wu and Zumbo (2008), a regression analysis should be used if the moderator is measured on a quantitative scale. This study's moderation analysis used ordinary least squares analysis (OLS) as academic productivity is a continuous outcome. Ordinary least squares attempt to minimize the sum of squares error through the fitting of a regression line that best fits the data. Linear regression estimates the parameters of a model so that the dependent (outcome) variable can be predicted from the estimates of the independent (predictor). Ordinary least square regression develops the best fitting model by making the sum of the squared residuals (Hayes, 2018). The model for this study uses multivariate regression as academic productivity is modeled to be a factor of three independent variables (motivation, tenure status, and rank). Of special interest is the conditional indirect effect of X (motivation) on Y (academic productivity). This indirect effect models how tenure status and rank moderate the effect of motivation (Table 1).

As seen above, the equation claims that academic productivity is a function of three variables and several interactions (moderations). The moderators will take the form of a binary (Tenure/No tenure but on track) and three levels (Assistant/Associate/Full) with interaction among these (Figure 7).

Threats to validity

Internal validity and external validity are two sets of criteria used in research to determine the value or worthiness of an experimental design (Salkind, 2011). The internal validity of an experimental design refers to the confidence that the generated results are actually due to the manipulation of the independent variable, and not due to some other factors. External validity refers to the generalizability of results from the original sample to the population. All empirical research in the field of education has threats to internal and external validity; however, researchers often fail to report the threats due to the fear of revealing the weaknesses of their research (Onwuegbuzie, 2000). Onwuegbuzie outlines the advantages of discussing threats to internal and external validity: 1) when the researcher provides information about the sources of invalidity, the reader can interpret the findings in their proper context; and 2) the identification of internal and external validity guides future research, more specifically replication studies.

Aligned with the previously mentioned advantages of revealing validity threats to the reader, the researcher reported several possible threats to internal validity in this study including history, instrumentation, and history x treatment interaction (Onwuegbuzie, 2000). Referencing Campbell and Stanley's eight threats to internal validity, this study may have included the threat of history which "refers to the occurrence of events or conditions that are unrelated to the treatment but that occur at some point during the study to produce changes in the outcome measures" (Campbell and Stanley, 2015; Onwuegbuzie, 2000, p. 15). Internal and extraneous events can trigger this threat. A second threat is instrumentation due to the chance that the scores yielded from a measure is inconsistent, (low reliability) or are not valid (Onwuegbuzie, 2000).

In addition to internal threats, it is important for the reader to be

Table 1, NSOPF survey sections.

Section Title	Section description	Variable	Questions included in this study	Justification
Nature of Employment:	Questions on faculty duties, status, rank, and principal	Categorical	Information is considered the present study	Linking the data gathered from this section as a basis of data interpretation to serve the purpose of the study.
Scholarly Activities:	Questions on academic productions such as articles, books, and journals	Scalar	Information is considered as the focal purpose of the present study	Looking at the nature of academic productions of faculty and linking it to sections A and B (tenure vs. non-tenure) and section C to see whether workload has an effect on their academic production and involvement.
Job Satisfaction:	Questions on how satisfied faculty are with the institute, workload, salary, etc.	Scalar	Internal Factors: Qu 61, Qu 62, Qu 63	Addressing external and internal motivation factors
Compensation:	Questions on the amount of faculty income from various sources and their overall household income.	Scalar	External Factors: Qu 66, Qu 67	Addressing external and internal motivation factors in form of the nature of rewards and compensation high redaction institutes provide their faculty.

In particular the model for this study is :Academic Productivity = b_0 + b_1 (Motivation) + b_2(Tenure) + b_3(Rank), (x) + b_4(Motivation*Tenure) + b_5(Motivation*Rank) + b_6(Tenure*Rank), + b_7(Motvation*Tenure*Rank).

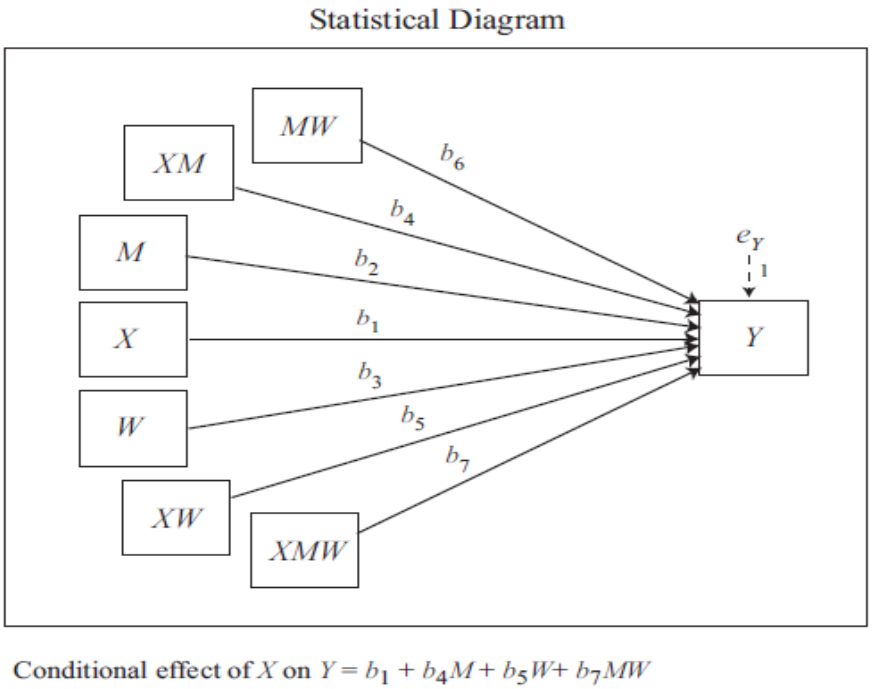

Figure 7. Mediation and Moderation templates for PROCESS macro.
Source: Hayes (2018).

aware of external validity threats in this study, which commonly occur at the research design/data collection stage of a study (Onwuegbuzie, 2000). Onwuegbuzie reports that regardless of being random or non-random, all samples in educational studies inherently breed population and ecological validity concerns due to sampling errors, which threatens external validity. "Population validity refers to the extent to which findings are generalizable from the sample of individuals on which a study was conducted to the

Table 2. Descriptive statistic of the targeted population (n=10557).

Variable	M	S.E.	S.D.
Faculty rank	1.87	0.008	0.823
Faculty tenure status	1.31	0.004	0.461
Faculty scholarly activity*	0.80	0.004	0.399
Faculty satisfaction index	1.781	0.005	0.493

*Scholarly activity refers to all recent articles and refereed journals the faculty participated in.

Table 3. Descriptive statistic of tenure status by rank (n=10577).

Rank	Frequency		Percent		Cumulative percent	
	Tenured	Tenure track	Tenured	Tenure track	Tenured	Tenure track
Professor	4,221	115	57.66	3.55	57.66	3.55
Associate	2,760	477	37.70	14.74	95.37	18.29
Assistant	339	2,645	4.63	81.71	100	100

Table 4. Descriptive statistic of tenure status by recent academic activity (n=10577).

Rank	Frequency		Mean		S.D.	
	Tenured	Tenure track	Tenured	Tenure track	Tenured	Tenure track
Professor	4,221	115	3.44	2.2	5.247	4.606
Associate	2,761	477	2.247	2.815	3.494	4.13
Assistant	339	2,645	0.475	2.241	1.394	3.065

larger target population of individuals" and ecological validity refers "to the extent to which findings from a study can be generalized across settings, conditions, variables, and contexts" (Onwuegbuzie, 2000: 30).

RESULTS AND DISCUSSION

This study sought to investigate the relationship between research productivity and motivation to conduct such activities at higher education institutes by looking at the academic productions of tenured and not tenured faculty members. Therefore, in this section previous studies on both external and internal factors related to faculty motivation and the relation between pre/post-tenure and productivity are summarized in order to reach an in-depth analysis of the possible correlation between faculty status and academic production. The overall general hypothesis of this study is that when the faculty members gain permanent/tenured status, their academic production, which is an indicator of motivation, decreases, and the number of overall academic production of faculty will decrease after being granted tenure status.

Descriptive statistics

To serve the purpose of this study and address all the research questions, the researcher narrowed down the sample by eliminating answers from all staff since they were not the target population for this study. Consequently, from the total of 35,000 faculty and staff responses to the NSOPF 2004, 10,557 faculty members' survey responses from 1,080 higher education institutes were investigated for the purpose of this study. Table 2 reports the descriptive statistics of this population, which can answer the first research question in part.

Taking a closer look at the descriptive analysis gave the researcher a better insight into who the studied sample was and a more detailed answer to the first research question. Table 3 shows that out of the total of 10577 faculty, 7,320 (69%) had tenure status at the time of the survey and the rest (~31%) where faculty who held a tenure-track status but were not granted tenure yet. Table 3 reports that there were more faculty who had tenure status and held associate or professor rank, compared to faculty members who were not tenured yet and held mostly assistant professor rank.

Similarly, Table 4 presents the descriptive statistics of the sampled faculty and their academic activities. It is worth mentioning that the survey defined academic activity as articles published in refereed and non-refereed professional or trade journals; creative works published in juried media; published reviews of books, articles, or creative works; chapters in edited volumes; textbooks and other books; monographs; research or technical reports disseminated internally or to clients;

Table 5. Descriptive statistic of tenure status by satisfaction (n=10577).

Rank	Frequency		Mean		S.D.	
	Tenured	Tenure track	Tenured	Tenure track	Tenured	Tenure track
Professor	4,221	115	1.840	1.847	0.546	0.520
Associate	2,761	477	1.985	1.9	0.545	0.555
Assistant	339	2,645	1.931	1.921	0.600	0.540

presentations at conferences, workshops, exhibitions or performances in the fine or applied arts; and even patents and computer software products within the last two years.

Table 4 reports that tenured full professor faculty (M= 3.44, SD = 5.247) produced more academic activities overall in comparison to tenured associate and assistant rank faculty (M=2.247, SD = 3.494; M= 0.475; SD = 1.394), respectively. Among non-tenured faculty, associate professors (M= 2.815, SD = 4.13) had the highest number of academic activities and non-tenured faculty who held the professor rank (M= 2.2, SD = 4.6) had the least number of academic activities. In fact, when associate professors' recent activity was compared to assistant professors, the difference in means of 0.574 was significant with t (479.9) = 3.538, p<0.001. As a result of this probe, an ANOVA was run to assess the differences across ranks and academic activity.

According to the ANOVA, that considered tenured faculty resulted in F (2.7318) = 106.596, p<0.001. A Tukey Post Hoc test revealed the difference between full and associate was significant with the difference = -1.193, p <0.001, 95% CI (-1.453 to -0.933). Similarly, the difference between full and assistant rank professors was shown to be significant as well with the difference of -2.965, p <0.001, 95% CI (-3.565 to -2.3653) as it was when comparing the associate professors and associate professors with the -1.7720 difference and p <0.001, 95% CI (-2.384 to -1.16).

An ANOVA test for the tenure track faculty resulted in F (2,3234) =6.17, p=0.002, where a Tukey Post Hoc test revealed the difference between full professors and associate professors was significant as the difference = 0.615, p= 0.173, 95% CI (-0.19 to 1.42). Neither was the difference between full and assistant rank professors which showed no significant difference of 0.0410, p = 0.9907, 95% CI (-0.697 to 0.779). When associate professors were compared with assistant professors, there was a significant difference (-0.574, p<0.001, 95%CI=-0.959 to -0.188).

In this research, both extrinsic and intrinsic factors influencing faculty research productivity determined by the survey questions have been studied. As formerly mentioned, extrinsic motivation factors which can affect faculty academic productivity usually come from institutional expectations, where intrinsic motivation factors are influenced by the faculty's personal reasons. Motivation is derived from using the satisfaction related items in the survey. Although external factors such as monitory incentives, scholarly activities of administrators and chairpersons, as well as workload, time spent on different job-related activities do play a contingency role in performance, intrinsic factors related to the study, that is, time spent on not job-related activities at the workplace, overall job satisfaction, and faculty opinion of the higher education institute have to exist for the faculty to perform and produce academically; incentives alone have little correlational impact on faculty performance. Therefore, despite the significance of both intrinsic and extrinsic motivation factors, one of the hypotheses of the present study was that intrinsic factors overall remain a better predictor of faculty performance. Motivation was also identified with its determining factors and indicators. There are just so many factors from different sources that it is hard to differentiate them sometimes. Since this research is looking at higher education, it is focused on only motivation factors affecting tenured faculty members. Therefore, in this study, the survey questions pertaining to satisfaction were treated as an inclusive indicator of faculty intrinsic and extrinsic motivation index.

The data in Table 5 shows the tenure status of faculty according to their job satisfaction. At first glance, the mean between faculty members who hold the same ranks did not appear to be significantly different; that is, job satisfaction among faculty who held assistant professor rank was very close. In fact, from the sample population selected for this study, all reported similar results. However, a simple ANOVA was run, and it was found that for tenured faculty, only the ANOVA resulted in F (2,7318) =58.991, p<0.001, where a Tukey Post Hoc test revealed the difference between full and associate was significant = 0.145, p <0.001, 95% CI (0.114, 0.176). Similarly, the difference between full and assistant rank professors was shown to be significantly different at 0.091, p = 0.009, 95% CI (0.019, 0.164); however, the difference between associate professors and assistant professors was not significant (Diff=-0.054, 95%CI=-0.128 to 0.019, p=0.201).

The same ANOVA test for the tenure track faculty resulted in F (2,3234) =1.2515, p=0.286, where a Tukey Post Hoc test revealed that contrary to the results from tenured faculty, the difference between full professors and associate professors was not significant = 0.053, p=0.614, 95% CI (0.0789, 0.1849). Similarly, the

Table 6. Linear regression results of moderation model (N=10577).

Variable		Coefficient	SE	t	p	LLCI	ULCI
Constant		3.048	0.236	12.924	0.000	2.585	3.509
Satisfaction	b1	0.2278	0.132	1.7310	0.0835	-0.030	0.486
Tenure Status	b2	-4.778	1.496	-3.193	0.0014	-7.711	-1.845
Associate Professor	b3	-1.34	0.390	-3.431	<0.001	-2.105	-0.574
Assistant Professor	b3	-2.884	0.811	-3.557	<0.001	-4.473	-1.295
Moderators							
Motivation x Tenure Status	b4	2.060	0.840	2.453	0.014	0.414	3.707
Motivation x Rank (Associate Prof.)	b5	0.064	0.209	0.304	0.761	-0.346	0.473
Motivation x Rank (Assistant Prof.)	b5	-0.052	0.438	-0.120	0.905	-0.911	0.806
Rank x Tenure Status (Associate Prof.)	b6	4.915	1.687	2.914	0.004	1.609	8.221
Rank x Tenure Status (Assistant Prof.)	b6	6.265	1.715	3.654	<0.001	2.904	9.626
Motivation x Tenure Status x Rank (Associate Prof.)	b7	-1.806	0.938	-1.924	0.054	-3.646	0.033
Motivation x Tenure Status x Rank	b7	-1.908	0.953	-2.002	0.045	-3.777	-0.040

difference between full and assistant rank professors was not significant as well as that of 0.074, p = 0.323, 95% CI (0.0469, 0.1949). The comparison between the tenure-track associate professors and assistant professors, however, showed results similar with the tenured faculty members (Diff=0.0210, 95%CI=-0.0421 to 0.0841, p=0.7156).

Regression results

To answer the second and third research questions, a moderation model was run to determine if a faculty member's tenure status, rank, and motivation could predict recent publication activity both unconditionally (no moderation) and conditionally (moderated). The conditional results are the various interactions among the variables to illustrate how tenure, rank, and motivation moderate the effects of each and in combination with onto recent publications. The results from the moderation analysis are presented in Table 6. The data are reported to show the estimated coefficient, the t statistic, associated p-value and the lower and upper confidence intervals. The data are interpreted such that when the t statistic is at least ±1.96 in value, it is assumed that p will be no larger than 0.05, and the confidence interval will not have zero within the estimated range. The estimated coefficient will be assumed different from zero.

The model was found to be significant with F (11, 10545) = 28.456, p <0.001, r2 = 0.028. While the overall model is significant, the very small coefficient of determination implies that approximately 97.2% of the variance in recent scholarly activity is not accounted for by the current model. Reviewing the results in Table 5 suggests that the estimated value of the constant is 3.048, t = 12.924, p <0.001. This shows that on average it is estimated that all faculty members in this sample were predicted to have approximately three refereed articles published in the last two years.

Here we will present the unconditional estimates and simple interactions. Tenure status was coded as a dichotomous variable with professor coded as zero, meaning that an estimated coefficient will be the estimated relationship between faculty who reported that they were "On Tenure Track, Not Tenured" and the number of refereed journal articles within the last two years. Given this, the reported estimated value of -4.77 means that the faculty members who were on the tenure track and not tenured were predicted to have had 4.77 fewer articles over the two-year period as compared to tenured faculty members holding all other variables constant. This is a significant finding since it contradicts one of the hypotheses of this study and counters previous research. As mentioned above, it was originally hypothesized that when the faculty members gain permanent/ tenured status, their academic production, which is an indicator of motivation, decreases and the number of overall academic production of faculty will decrease after being granted tenure status. When considering faculty rank, the estimated coefficient for faculty who reported that they were at the associate professor rank was -1.34, meaning that as compared to full professors, associates had fewer articles published during the two-year time frame. Consistent with the preceding, assistant professors were predicted to have 2.8 less scholarly activities than faculty members who held professor rank. In sum, faculty members at the professor rank in this sample are predicted to have a greater number of referred articles during the most recent two-year period.

The moderation results are reported next in the table with the first moderation of tenure status on motivation. The moderation analysis shows that for faculty without tenure who are on tenure track as compared to tenured faculty, it was estimated that they have approximately 2.06 published articles over the two-year period. This

result is significant (p = 0.014), implying that taken together, motivation and tenure status do have positive and significant association with productivity. The results for the next moderation, between rank and motivation, report that a very small increase in referred publications is associated with the lower faculty rank of associate compared to professor; however, caution is warranted as the estimated coefficient here is not assumed to be different from zero (t = 0.304, p = 0.761). This implies it is risky to interpret this estimation in isolation. Similarly, when considering the rank of assistant compared to professor, the estimated coefficient is again not significant (t = -0.12, p = 0.905), implying this result must be interpreted cautiously. The remaining four moderation results do provide significant insight into how and for whom recent refereed journal articles are affected when considering how tenure status, rank, and motivation moderate each other.

The results for the moderation of rank and tenure status report that there was a bigger increase in the number of academic activities associated with the lower faculty rank of associates compared to faculty who had assistant and professor rank. The estimated coefficient is assumed to be different from zero, reporting the p-value (t=2.914, p= 0.004) for this variable less than the significance level. Although the moderation model as a whole is what this study focuses on; when individual coefficients, like in this case, is different from zero, caution should be taken in interpreting this finding in isolation, as it was for the moderation effect between tenure status and rank when motivation is a constant. In other words, tenured associate professors had done more academic activities than faculty members who were assistant professors and full professors. Similarly, the academic activity of faculty with assistant professor rank was reported to be higher (CE= 6.265) than the academic activity of both associate professors and full professors. In this case, since the estimated coefficient is assumed to be different from zero (t=3.654, p <0.001), this finding can be interpreted in isolation and can tell about the academic activities of assistant professors who were in this sample; that is, not-tenured assistant professors had done more academic activities in the last two years than faculty at the rank of professor and associate. Here the conditional effects are presented. As the model becomes more complex and additional variables are considered, the results begin to show the intricate relationships among the variables. As Table 5 shows, when comparing associate professors with professors and assistants, and considering motivation as well as tenure status of the faculty, the results are marginally significant (t=-1.924, p= 0.054) and only suggest that associates produce -1.81 scholarly works fewer than the other two ranks and for assistant professors; they produce -1.91 scholarly works fewer than the other two ranks with tenure.

The conditional effect of motivation on scholarly activity is,

$$b_1 + b_4 Tenure + b_5 Rank + b_7 Tenure*Rank \quad (1)$$

So, substituting the estimations from the above we have

$$0.2278 + 2.06(\text{Tenured}) + 0.064(\text{Associate}) - 1.81(\text{Tenured Associate}) \quad (2)$$

Interpreting this it was found out that for tenured associate faculty, the values in the parentheses are all equal to 1, yielding a final estimate of 0.542. This means that for tenured associate faculty, a one unit increase in satisfaction is estimated to increase scholarly activity by 0.542 units. For assistant rank tenured faculty, we substitute the values from the estimation and get

$$0.2278 + 2.06(\text{Tenured}) - 0.052(\text{Assistant}) - 1.91(\text{Tenured Assistant}) \quad (3)$$

So, the results show that the conditional effect of a one-unit increase of satisfaction on scholarly activity for tenured assistants is estimated to be 0.326. In both cases, as motivation increases, scholarly activity is also estimated to increase. Now, if we examine the above for non-tenured faculty at the same ranks, the second and fourth terms drop out, and the conditional effects for associates and assistants are both 0.292. This shows that as motivation increases, both the associate and assistant rank faculty will have increases in productivity as compared to the other ranks. What is also interesting is that tenure is predicted to yield higher increases in scholarly activity as compared to tenure track faculty.

The findings of this study suggest that there is a significant difference in the number of academic activities among faculty of different ranks and tenure status. This difference was significant among full and associate professors, and associate professors and assistant professors, regardless of their tenure status. However, the difference was not significant among the non-tenured full and assistant rank faculty. This may suggest that overall, among the sample population of this study, tenured faculty were more actively involved in presenting scholarly products.

Since this study is focusing on the topic of motivation, both extrinsic and intrinsic factors influencing faculty research productivity was considered and the survey questions pertaining to satisfaction was treated as motivation indicators among the studied population. Findings suggest that there is an active interaction among the three key factors of motivation, rank, and tenure status which affects the academic involvement of faculty. The analysis of the moderation model proved to be significant and indicated that the model used for this study has some utility. The results reported that faculty members who were on tenure track and not tenured had fewer academic articles over the two-year period as compared to tenured faculty holding tenure status as the constant variable. For the same population, the findings

also suggested that tenured faculty who held professors ranks and non-tenure assistant professor faculty produced the most academic articles in their respective groups according to tenured status.

Almost all higher education institutes use faculty scholarly production as one of the most important conditions under which one can achieve and/or maintain a permanent tenure position (Faria and McAdam, 2015; Levine, 2017). Therefore, scholarly products are one of the means for faculty to gain tenure status. Studies such as those by Estes and Polnick (2012) explored this hypothesis for a very small population, concluding that faculty's academic production declined after they gained permanent/ tenured status. This finding suggested that tenured faculty at higher education institutes are unmotivated to engage in active scholarly activities and academic production. This study investigated this idea on a larger scale and examined the number of academic products of approximately 10557 out of 35,000 tenured and not tenured faculty members who participated in the NSOPF 2004 Faculty Satisfaction survey. Given the previous findings in related research, the overall general hypothesis of this study was similar to that of Estes and Polnick (2012). Specifically, the hypothesis presented stated that once tenure was achieved, motivation towards academic productivity would decline for all ranks and levels. Since this research examined higher education faculty, it focused on only motivation factors affecting tenured faculty members; according to Estes and Polnick (2012) "many organizational leaders and behavioral scholars consider the dynamic relationship between motivation and sustained effort as the key to understanding and predicting productivity of human resources" (p. 1). In this study motivation factors were narrowed down to only the number of academic activities among this particular population and hence the factors such as stability and job security were taken into consideration in this survey.

At most higher education institutes, after getting tenure status, there is no immediate requirement for the faculty to conduct studies and research, attend conferences, apply for grants or any other academic achievements and/or scholarly products, or engage in community events. Arguably, talented professors at higher education institutes have used their academic profession as a carrier ladder to advance based on factors such as their performance and quality of research to acquire reasonable guaranteed long-term employment through the tenure-track system. Universities on the other hand also developed rigorous evaluation systems and post-tenure review process in place to measure the productivity of the faculty based on performance and academic contribution (Altbach, 2013).

In other words, when self-satisfaction and a general feeling of achievement are acquired, intrinsic motivation factors are in place, which is also triggered by the higher education requirements. Both motivation factors combined can affect faculty scholarly production, before and after tenure, for all academic ranks. When tenured faculty with higher academic rank engage in scholarly activity in order to enjoy it and/or to satisfy self-interest without any negative consequence or reward expectation, they produce more and enjoy doing research simultaneously (Kurose, 2013; Estes and Polnick, 2012; Eccles and Wigfield, 2002; Pintrich and De Groot, 1990; Pintrich, 2000, 2004, Pintrich and Zusho, 2007; Barron and Harackiewicz, 2000; Howey, 1999; Altbach et al., 2009; Dunigan and Curry, 2006; Price and Jenkins, 2005).

This study investigated the general hypotheses that the overall academic production of faculty will decrease after being granted tenure status. However, the results could not support this hypothesis among all ranks and employment status. The ultimate goal for a higher education institute is to have more satisfied and motivated faculty and staff, in order to improve the quality of instruction which could consequently affect the rating of the university and the number of grants given to the institute.

Moreover, with the growth of adjunct and part-time faculty positions in higher education, the number of full-time, tenured positions has subsequently declined since 2006 (Jaschik, 2009a). The hiring of more part-time or adjunct faculty is an attempt by universities to reduce costs (Eckel and King, 2007; Bland et al., 2006; Markman et al., 2008). This matter not only affects universities and colleges, but it also affects students' performance. According to Eagan and Jaeger (2008), students who are exposed to part-time faculty members are less likely to transfer from a two-year community college to a four-year institute (p. 179). The findings of the current study contradict the results reported in the studies mentioned above. As indicated previously, the American Federation of Teachers (AFT) has put a great amount of effort into encouraging higher education institutes to have a greater percentage of jobs go to tenure-track faculty members as well as better salaries and benefits for those teachers who are on a tenure track. It has been demonstrated that when faculty members are motivated, they perform better in class, improve instruction, design more practical curriculum, and, therefore, their students also perform better (Jaschik, 2009b; Zeichner, 2014).

This study found that faculty with higher rank and tenure status produced more than faculty who did not hold a permanent status at the higher education institute. This seems to suggest that rank and tenure matter. While this study did not include adjunct or part-time faculty in the sample, it appears that with full-time faculty, higher rank and the awarding of tenure can support academic productivity. Therefore, a possible implication of this finding is that if institutions want to have a bigger presence in the area of knowledge creation or impact on the quality of societies, then rank and tenure status should be awarded to faculty matters.

Limitations of the study

This study was limited to faculty members who participated in the NSOPF 2004 survey. In addition, due to the focus of the study, approximately two-thirds of the overall sample was not used in the analysis. Any implications drawn from the study must be viewed cautiously as it only pertains to faculty at the rank that secured tenure or were currently pursuing it. Second, the sample is old, meaning that much may have changed in higher education; while true, the fact that the tenure and rank system remains the hallmark of higher education means that inferences can be drawn from this system as to the implications it has on academic productivity. Third, the time frame on which these SAA are measured may be a problem, as it may not adequately capture the ebbs and flows of SAA. In addition, there were no data included as to the timing of the awarding of tenure relative to this two-year period. A more sensitive measure that included when and where tenure was awarded could better represent the scholarly work faculty do; however, the way such work was communicated limited model design. Finally, the manner in which motivation was established has limitations. While motivation is a construct and can be defined in numerous ways (Boundless, 2016; Cerasoli et. al., 2014; Hardré and Kollmann, 2012; Heinrich and Oberleitner, 2012; Howey, 1999; Waltman et. al., 2012; Sogunro, 2015), any instance when this is done can present limitations on the implications drawn from this work.

Recommendations

According to the American Association of University Professors (AAUP), the primary reason for tenure status for higher education faculty is to preserve academic freedom and to transmit knowledge without the fear of job loss. AAUP emphasizes the importance of faculty tenure status and stresses on the positive impact it has on the public interest and promotion of research integrity among faculty. The number of tenured faculty has declined to 21% in the past (Levine, 2017). It was not the intent of this study, and the results did not confirm nor deny, the effectiveness of the overall tenure and rank system procedure at universities and colleges nationwide. Research has shown that there are some higher education institutes where tenure and rank system appears to be functioning well; thus, the system should continue the way it is (De Lourdes Machado-Taylor et al., 2016; Alonderiene and Majauskaite, 2016; Tang and Chamberlain, 2010). Tang and Chamberlain (2010) examined not only tenure and rank similar to the current study, but they also considered other factors such as length of service and institutes on the attitude faculty develop towards engaging in research and teaching. They found that among the 233 professors from six regional state universities in Tennessee who participated in this study, length of service had a significant effect on research and teaching perception, which can be similar to the current study. This study also found that tenured full professors had the most SAA among the target population. Also similar to this study, they found that lower than professor rank faculty members' teaching was influenced by rewards, explicitly acquiring a higher rank. On the contrary, Figlio et al. (2015) conducted a study on the quality of tenured and not tenured faculty and found that tenured faculty had lower instruction quality than their contingent colleagues.

It is recommended that, since the current study accounted for only three percent of the survey population, a different model should be adapted to include more variables such as faculty biographical impact (male, female, head of the household, etc.), U.S. born vs. not U.S. born faculty SAA, and interdisciplinary research vs. in-field studies, as well as the effect of faculty status and rank on the overall higher education institute rank; all of which are questions from the NSPOF 2004 survey. Moreover, just like all great studies, a replicate of the current study with more updated data could give researchers in the field a clearer insight into the more current trends in higher education. Lastly, incorporating interviews with faculty to add a qualitative aspect to the study and conducting a mix-method study with the same/similar theme would be priceless.

Conclusion

The results of this study could not validate all aspects of the Expectancy Theory predictions in a multi-dimensional manner. Although academic productivity was defined not only as research but also teaching and engaging in service to the community, refereed articles, and presentations; there were more factors involved in predicting faculty motivation than their tenure status and academic rank. Further studies should be conducted to help education leaders to review current policies and practices regarding faculty performance assessment, evaluate the effectiveness of such policies specifying possible factors which could contribute to the professional growth of faculty members at higher education institutes, and operationalize tenure policies to include motivational elements.

Currently, with the increased number of universities, improved services and features that almost all universities share, and the variety of fields of study that they offer, the question of the practicality of higher education has narrowed down to the situation of affordability and ranking of the higher education institutes. Both of these are closely attached to the quality of instruction of the faculty members and the creativity of faculty into doing genuine research in order to secure funding through various sources for their higher education

institute. Otherwise, choosing a university or college in this day and age is the comparison between apples and apples. It is the faculty of a higher education institute that brings value, quality, and consequently money to the school and will also increase or raise the rank of the school.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Semiotic procedural knowledge model on solution of problems and problem-solving analysis

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This study aims to use problem solving techniques in solving problems at different stages step by step. The theoretical and experimental semiotic model was developed by using the semiotic model method, which can be established with the relation of priority-recency, and an analysis of the problem solving skills of the students was made. Given that the procedural knowledge questions are used as the type of question to be applied in the development of the semiotic model, the model to be developed is called the semiotic procedural knowledge model. The experimental model will be established with the data collected from 34 science teacher candidates by means of using the qualitative method. Comparing the theoretical and experimental model, analyses will be made to compare the students' knowledge levels and success levels in the steps used correctly or incompletely in problem solutions. These analyses reflect students' ability to establish a relationship between scientific knowledge and technology.

Key words: Problem solving techniques (PST), Semiotic procedural knowledge model (SPKM), procedural knowledge, knowledge-centered assessment.

INTRODUCTION

The first work in science education is the teaching of science. Naturally, science teachers place the building stones of science for individuals. Science can be taken as a process of knowing and / or understanding for individuals in educational processes. However, it can be said that individuals or institutions involved in educational processes have an explicit or implicit righteous expectation from teaching science, as well as teaching the application of science. A strong bridge can be established between science and its applications through the use of questions and problems.

Scientific knowledge can be expressed with different types of knowledge. One of the types of knowledge in which scientific knowledge can be expressed is the procedural knowledge. Researches show that science teachers and teacher candidates experience problems in the areas of conceptual knowledge and procedural knowledge. One of the sources of these problems is the inability to meet the educational needs of teachers at universities adequately (Verdugo and Solaz, 2019), while the other is the initial level of knowledge, that is pre-university stages (Tapia et al., 2019). Clearly there is overlap between the teaching of science and other areas of knowledge. We must constantly develop new methods to teach and differentiate between science education and teaching science in response to the changing needs of

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our students (Callahan and Dopico, 2016).

Procedural knowledge is one of the knowledge that is needed to understand concepts and develop problem solutions. Procedural knowledge is the knowledge of working procedures, steps and how to solve problems according to these steps (Wuryaningrum et al., 2020). Procedural knowledge can be defined as knowledge that includes sequential action steps and the application of automated techniques to solve problems (Aydı and Özgeldi, 2019). Apart from the situational and conceptual knowledge, procedural knowledge (including solution strategies) is of particular interest, but since it is much more difficult to measure, refined procedures should be developed for this type of knowledge, including a suitable benchmark to measure and evaluate procedural knowledge (Richter-Beuschel et al., 2018).

Like other topics in science, students' success in solving the equation depends on the learners' grasp of certain types of knowledge in equation solving (Rittle-Johnson et al., 2001). These two types of knowledge in equation solving may not be clearly separated from each other. The interplay between procedural and conceptual knowledge occurs in the procedural step when the learner selects an operation to change the state of the equation and yet at the same time to maintain the equality of the equation (Ngu and Phan, 2016). Experts in certain disciplines often choose appropriate procedures to produce an efficient or elegant solution to a mathematical task. This flexible procedural knowledge distinguishes novice and expert procedural performances (Maciejewski and Star, 2016).

With PSTs, the mathematical thinking of students can be affected in a positive manner (Singh et al., 2018). Various evidences have been presented on the matter that thinking is an effective tool for students to improve their knowledge structures. By means of thinking, a student tries to explain and create a subject during the learning process (Sarwar and Trumpower, 2015). However, while solving tasks that are directed as conceptual and procedural comprising of length, area and mass measurement, the students may experience conceptual mistakes and faults. Such basic conceptual mistakes indicate that the students experienced difficulty in understanding the relations, along with the procedures ad formulas used for measurement (Tan and Aksu, 2016). When students are asked to map certain knowledge used in the teaching processes by means of using the mapping strategies, the teachers can be provided with substantial support in terms of understanding the units (Giamellaro et al., 2017). Within the scope of solving complicated problems, causal mapping can be used in order for strategic decisions actions to be supported (Öllinger et al., 2015). The teachers can successfully guide their students through open questioning processes by means of addressing the conceptual, epistemic, social and/or procedural areas (van Uum et al., 2016).

Problem solving techniques (PST)

Problem solving techniques can be created from specific phase and steps. Students can solve these problems by applying these phases step by step. In the problem-solving phase, it can activate students' previous knowledge, become aware of knowledge gaps, and discover deep features of the target content, which can prepare them to better handle the next instruction (Loibl et al., 2020).

PSTs can be developed in line with various purposes. In addition to differing from each other, they also differ in terms of problem detection approaches, solving techniques and interpretation of results within various disciplines. To give an example, developed by means of the effects of four-stage Polya problem solving technique (Yong et al., 2018; Okafor, 2019), empathy-based problem solving technique (Lewis et al., 2019), problem solving technique oriented at metacognition measurement (Haeruddin and Supahar, 2020), problem solving techniques of representative technologies (McCollum et al., 2016) or problem solving of causal mapping (Öllinger et al., 2015), PSTs differ from each other in terms of both improvement purposes and criteria. Additionally, brain-storming based creative problem solving techniqes comprise five steps: "*CPS five-step model, comprising Fact-Finding, Problem-Finding, Idea-Finding, Solution-Finding and Acceptance-Finding*" (Sousa et al., 2014a). On the other hand, small group problem solving technique has also been developed by means of adopting the four stages of creative problem solving techniques into the group studies (Sousa et al., 2014b).

When PST is developed by means of dividing the problem into parts and solving it as step by step, priority-recency relations can be established between the steps of this tecnique. This technique generally comprises inputs-outputs for (G-A), free body diagram (FBD), formula, definition and process steps (Yılmaz, 2016a, 2016b, 2014, 2012). This step can be used more effectively in the problem solving of courses like biology or those of social content, since the definitions are not substantially used within the numerical problem solving processes in courses like physics, mathematics, etc. By means of utilizing the priority-recency relations of problem solving steps, the semiotic model can be established, as well.

Semiotic procedural knowledge model (SPKM)

By increasing the visualization of knowledge in science as both process and product, the discovery of the roles of these methods has accelerated. It is a visual method in drawing. Researchers position this method as a potential key for reasoning and learning in teaching environments (Tytler et al., 2020). In drawing studies, markings can be

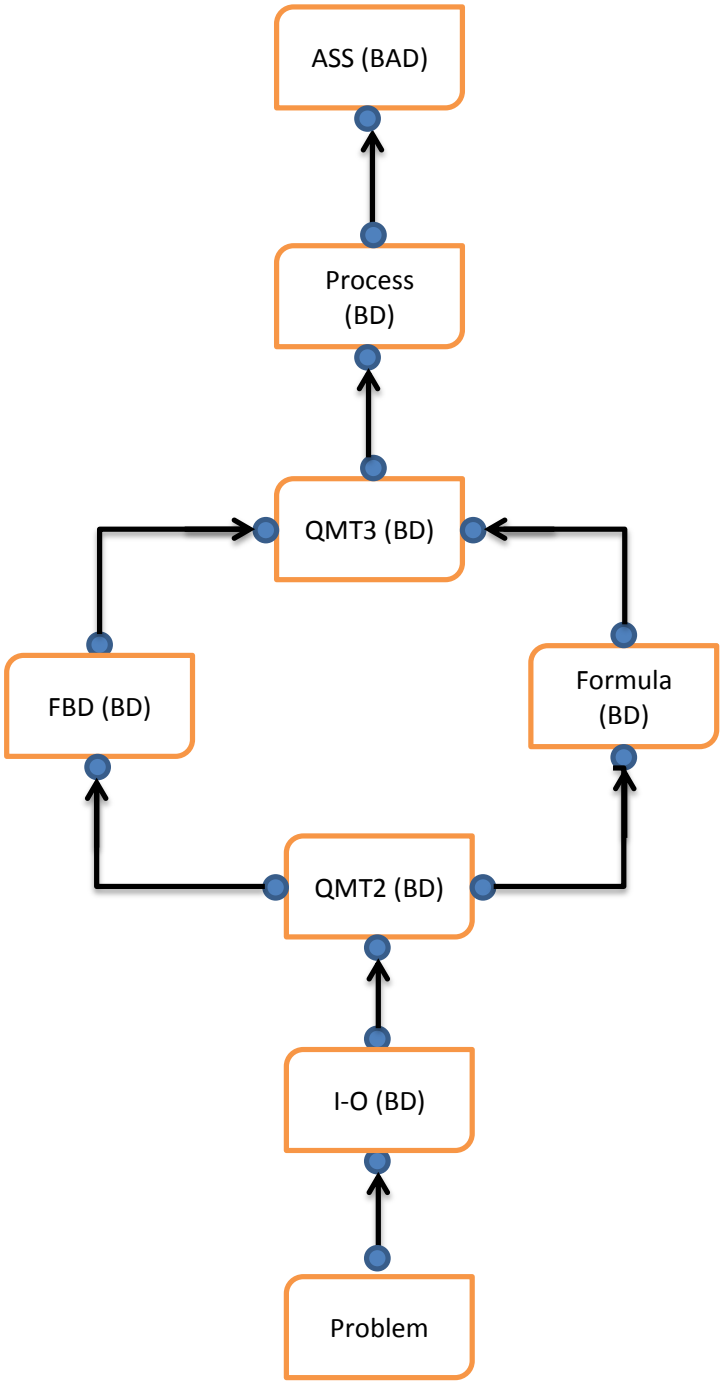
made for different purposes. It is used to: record dissections (Panagiotopoulos et al., 2016), translate text into an image (Leopold and Leutner, 2012; Brooks, 2009), interpret processes (Hubber et al., 2010), and enact speculative accounts of unfamiliar or abstract phenomena (Prain and Tytler, 2012; Ainsworth et al., 2011).

Semiotic model is based upon the empirical findings of Benjamin Libet in the neurophysiology of sensory awareness (Cantor, 2014a). Semiotic model is used by a number of different disciplines in line with the objectives of organizing the knowledge, convenient interpretation of the same and/ or rendering the knowledge more accessible. Just like a semiotic model can be developed for detecting the optimal character required for the sculpture placement area in order for an artist to ensure that the conceptions are transmitted to the audience (Erman and Boran, 2015), the same can be done for repsenting the mental processes (Cantor, 2014b), along with modelling, representing and interpreting various meical concepts (Kwiatkowska and Kielan, 2013), orgnaizing the problem solving (Roux and Kloot, 2019; Yılmaz, 2016a) or organizing the knowledge (Reid et al., 2019). There is a critical concept of semiotic modeling that directly addresses the core of the philosophy of education in the light of semiotics and affords valuable implications for the nascent interdisciplinary field of inquiry of edusemiotics or educational semiotics (Yu, 2017) Models provide a structure for organizing knowledge and facilitating learning (Reid et al., 2019). Problem solving is modeled in order to overcome the problems faced by students in problem solutions (Roux and Kloot, 2019).

The semiotic model of procedural knowledge, which has a crucial role in scientific knowledge, priority-precency relations of PST steps, pictorial diagrams (Özenli, 1999) and semantic networks (Özenli, 1999) can be used to constitute SPKM (Yılmaz, 2016a, b). Since SPKM will be prepared considering the priority-recency of PST steps, it can be more advantageous in teaching processes compared to other models. For problem solving of this research, a five-step semiotic model can be established, which are I-O, FBD, formula, process steps and the result of problem solving of the PST based on dividing the problem into separate parts, and solving step by step (Yılmaz, 2016a, b). The G-A step is used in the beginning of priority-recency relations at the I-O step for establishing the semiotic model, since it is possible to start with I-O step where the inputs and outputs are determined in the question at first for solving the problem. The next step within the priority-recency relation for developing the semiotic model is the FBD and/or formula, where the formulas are used in the process step for solving the problem. The problems to ensure the establishing of such semiotic model based on problem solving are limited to certain type of knowledge; this semiotic model becomes the model of that type of knowledge, as well. Rendering the problem solving-based semiotic model to be a procedural model can be ensured with three steps of PST. The first one will be created with the inputs and outputs of the problem. The hidden inputs of the problem should be able to be identified with open procedures within the I-O step. The second one is the free body diagram as one of the steps to provide convenience in process steps within the scope of identifying the required relation or formulas on the process step of the problem. The relation and/or formulas should be able to be identified through open procedures on the FBD step, as well. The third one is that the formulas should be able to be identified through open procedures in the formula step where the formulas that lead to the result can be found out with the inputs at the process step of the problem. In this way, a theoretical SPKM can be established based on problem solving, when these three steps are created with the processes that can be identified with open procedures. Since the elements of the measurement tools used in the research are limited to procedural knowledge problems, this model is named as SPKM (Figure 1).

Knowledge-centered measurement

The measurement tools used in education can be grouped into two main categories, either individually or knowledge-centered, based on what is to be measured or the superior purpose of measurement (Yılmaz, 2020). With the individual-centered measuring tools (classical measuring tools), the learning speed of individuals (students) in the educational process can be determined. With the individual-centered measurement, more contribution can be made into the development of appropriate teaching environments and methods that will increase the learning speed of individuals. With the individual-centered measurement, a controlled contribution can be made to better the education of individuals. Knowledge centered measurements can be made with probability measurement tools. Probabilistic measurement tools can be evaluated with knowledge theories or VDOIHI method, where probabilistic evaluation can be made (Yılmaz, 2020). Probabilistic evaluation gives how much of the knowledge an individual needs to accomplish. In this science teaching, it allows us to analyze how students can relate to scientific knowledge and technology. In professional life, it is important as much as the learning speed or capacities of individuals and how much knowledge they need to apply. It is important for the development of humanity to be expected from science education that individuals or institutions involved in education and training processes can also be able to practice science. Individuals can contribute to both themselves and the development of humanity in similar ways as much as they can transform their knowledge into practice.



BD: knowledge level
BAD: success level

Figure 1. Theoretical SPBM.

Objective

Equation approach based on two-step problem solving processes is a dominant strategy adopted by teacher candidates since it brings along low cognitive load (Ngu, 2019). Notwithstanding that this approach is a strategy used predominantly by teacher candidates, it cannot be said that sufficient studies have been carried out showing

Table 1. The steps of the PST that can be used to solve the questions of the basic measurement tool (the table shows the step of the PCT that can be used to solve the problem with "+").

	1	2	3	4	5	6	7	8	9	10
I-O	+	+	+	+	+	+	+	+	+	+
Formula	+	+	+	+	+	+	+	+	+	+
Definition										
FBD	+	+		+			+	+		+
Process	+	+	+	+	+	+	+	+	+	+

the effect of teacher candidates on their knowledge and success levels. It has been suggested that students have a low level of knowledge about certain subjects before university education, and in this aspect they become clearer when subjected to procedural and / or comprehension research. In addition, after completing the subject lesson in which they have a low level of knowledge, the level of knowledge increased significantly, but in some of the skills and competencies of stdents that need to be solved, basic conceptual errors and significant uncertainties have still been found (Tapia et al., 2019).

In this research, it is aimed for individuals to establish a strong relationship between science and technology, and the difficulties and deficiencies encountered in establishing this relationship can be determined by SPKM based on PST and contribute to the development of education with a new modeling. Theoretical and experimental semiotic model will be developed by using the semiotic model method, which can be established with the priority-recency relation of the steps of the PST; it is based on solving a problem step by step at certain stages, and the analysis of the problem solutions of first-year science students will be made, as well.

METHODOLOGY

The data of the study were collected from 34 science teachers' first year students. PST, used in problem solving before data are collected, has been taught and applied to first grade students. After the teaching of the PST, the related data were collected with three measurement tools that were validated in the teaching of the subjects; they are related to the questions of the measurement tool, without creating the ideal teaching environments specific to the research, after completing the subject processing in the natural teaching environment. The items of the three measurement tools were formed by open ended questions. The answer key for each measurement tool has been prepared. Each item of the answer keys prepared for the measurement tools was allocated into the PST steps as per the VDOIHI method. PST steps have been digitized through the VDOIGl method. The score "1" is used for digitization through this method by means of dividing the steps into the smallest significant parts. Comparing the digitized answer keys and the data collected from the students, the data digitization has been performed. The scores "-1, 0, 1" are used for the digitization of the data. Where the smallest significant part found in the data matches with the answer key, the score to be given is "1". The score to be given is "-1", where they do not match. For the smallest significant parts that are in the answer key, yet not found in the data collected, the score to be given is "0". Probability assessments will be carried out with the numerical values of these scores. This is a knowledge-centered assessment since to-be (the smallest significant parts of the answer key) and as-is (the smallest significant parts of the data) are subjected to assessment through probability processes in terms of their smallest significant parts through this method. Since the critical questions regarding what they need in procedural knowledge are required to be evaluated so that students can be informed about scientific practices (Kuhn, 2016), the first measurement tool created from questions related to the applications of students' scientific knowledge in technology and data were collected after the other two measurement tools were applied. The data of the research were collected from work and kinetic energy issues. In the analysis of the data obtained from three measurement tools, VDOIHI method and the package program of this method are used, where objective logic analysis of qualitative data can be made. From the data to be collected with the PST, the knowledge and achievement levels of the students can be analyzed with the VDOIHI method. The analysis of the qualitative data of the PST reflects students' ability to establish a relationship between scientific knowledge and technology.

Measurement tools

Three measuring tools were used in the research. The first (basic measurement tool) (QMT1) is the measurement tool in which students' level of knowledge and success can be determined in the steps of the PST. This measurement tool is the one that will use the steps of the PST in the establishment of the experimental semiotic model. The questions of the measurement tool consist of those related to the applications of students' procedural knowledge on technology in work and energy. There are 10 open-ended questions in this measurement tool that are validated and can be solved by the application of the PST. The steps of the PST that can be applied for each question of the basic measurement tool can be seen in Table 1.

The second measurement tool (QMT2) consists of 15 open-ended questions asking for the equations to be used in solving the problems of QMT1. Since this measurement tool is formed from the equations that should be given by the students in the formula and / or FBD digit of the basic measurement tool, the data of this measurement tool can be used in the analysis of the data of the formula, FBD and process steps of the basic measurement tool.

The third measurement tool (QMT3) focuses on measuring the mathematical logic structures of the operations in the process step of QMT1. In the questions of this measurement tool, mathematical propositions related to work and energy are given first. Then, with these propositions, questions related to mathematics and logic were asked. This measurement tool consists of 10 open-ended questions that have been validated. With this measurement tool,

Table 2. Students, knowledge and achievement levels.

Points/variable	Given-asked	Free-body diagram	Formula	Operation	Sum of variable
İS(S)	0.00	0.20	0.20	0.00	0.08
APS(S)	0.25	0.26	0.42	0.59	0.53
ANS(S)	-0.15	-0.18	-0.24	-0.14	-0.21
NAPS(S)	0.05	0.12	0.06	0.05	0.09
SS(S)	0.55	0.24	0.08	0.22	0.09
QMT2 S	0.73				
QMT3 S	0.27				
ASS	0.65				

students' level of knowledge and success levels can be analyzed in the process level of QMT1.

Assessment method

VDOIHI method will be used in the analysis of the data obtained by measuring tools. With this method, objective logic analysis of the data collected with qualitative measurement tools can be made. VDOIHI method can be used for qualitative data by digitizing the data. Symmetrical possibilities are calculated through the digitization of the qualitative data obtained by the measurement tool via the VDOIHI method. Then, by digitizing the data of the answer key, probability distribution numbers are calculated. Later on, symmetrical probabilities can be analyzed by obtaining findings in the section on probability distribution numbers. Where the findings belong to the problem solving steps, it gives the level of knowledge, and if it belongs to the result of the problem, it gives the success levels. VDOIHI combined step method will be used in the analysis of the data of this research (Yılmaz and Yalçın, 2011; Yılmaz, 2011). In the combined stage method of VDOIHI, if there is more than one stage in one section, these stages are converted into a single stage. This conversion process can be done with mathematical processes. For this, all scores of the same type in the stages of a section are collected. Since two scores are used in the digitization of the data in the VDOIHI combined step method, evaluation is made with two-based probability processes (Yılmaz and Yalçın, 2011; Yılmaz, 2011, 2017). Combination equation is used in these processes.

In order to analyze qualitative measurement tools with the VDOIHI method, measurement tools must have answer keys. VDOIHI method gives a score to the smallest meaningful parts in the answer key. If this method is to be applied to the PST, each step of the PST is defined as a section in this method. Each section can consist of multiple stages. From the sum of the meaningful smallest piece scores in the answer key, the score that can be taken at one stage is determined. By comparing the data obtained as a result of the application with the answer key, 0 or ∓ 1 scores are given to the smallest meaningful parts of the application data. The same type of scores of all stages in one part of the application data are summed and grouped and their scores are obtained, as well. These scores are taken as the number of symmetrical states of probability distributions. The sum of the scores in one part of the answer key is taken as the number of cases and the number of events. In the combination equation, symmetrical probabilities are calculated from the number of symmetrical states from 0 to the number of symmetrical states obtained from application data. Then the calculated symmetrical probabilities are summed up. Knowledge or success levels are calculated from the sum of the total symmetric probability divided by the number of probability distributions (Yılmaz and Yalçın, 2011; Yılmaz, 2011, 2017). If these processes are performed for the steps of the PST, the score obtained gives the level of knowledge. Where they are performed for the result of the problem, the score obtained gives the level of success.

Experimental SPKM

In the establishment of the experimental model, the theoretical model, of which PST was established in priority-recency order, will be used. If the score (knowledge level) in the problem solving step (section) is between 0 and 0.1 (0≤ *knowledge level*≤0.1), it will be regarded as an unused step and the semiotic relationship will not be shown because that step is used on a quite low level by the students. If the score obtained in the problem solving step is between 0.1 and 0.7 (0.1 <*knowledge level*≤0.7), it will be accepted that the step is used at the intermediate level by students and the semiotic relation will be shown with a dashed line {⇢}. If the score obtained in the problem-solving step is between 0.7 and 1.0 (0.7 <*knowledge level*≤1.0), it will be accepted that the step is used well by the students and the semiotic relationship will be shown with a straight line {⟶}. Thus, the representation of the semiotic model includes knowledge about the students' level of knowledge and achievement levels.

FINDINGS

The data obtained from QMT1, which consists of 10 open-ended procedural knowledge questions directed to 34 science teacher candidates in order to determine the level of knowledge and success in the students' PST steps, are given in the first five lines of Table 2. These findings show students' level of knowledge on work and energy. The data obtained with QMT2 through 15 open-ended questions asking for the equations to be used in solving the problems of QMT1, is obtained in the sixth row of Table 2. These findings show the level of knowledge of the students regarding the procedures of the formulas on work and energy problems. The data obtained with QMT3 in the process step of QMT1 created with 10 open-ended questions in order to determine the mathematical logic structures of processs is given in the seventh line of Table 2. These findings show students' mathematical logic knowledge level in work and energy problems. From the comparison of the result obtained in

the process step with the result of the answer key, the finding obtained by the combined VDOIHI method is given in the eighth line of Table 2. This finding shows the success level of students in work and energy problems.

The unrelated scores (US) obtained with QMT1 are given in the first row of Table 2; they are low for all variables (0.00≤US≤0.20). The students have negative scores in all significant smallest parts of a stage (unrelated). This indicates low levels of knowledge. The fact that the score of US in the I-O level is 0.00 indicates that the students do not establish irrelevant relationships in breaking down the problem. The most critical stage in the solution of a problem is the initial step; if unrelated relations are established in the initial step, the problem cannot be solved or the solution is rendered difficult by performing extra processes at the other steps of the PST. Although the students' formula knowledge level in the sixth row of Table 2, with work and energy obtained with QMT2 is as high as 0.73, students' 0.20 unrelated knowledge in the formula level given in the first row of Table 2 indicates that they have problems in associating formulas with problem. Similarly, the fact that QMT1 has an unrelated level of knowledge of 0.20 in the FBD level suggests that the positive scores (APS) in the formula level of the students decreases to a lower level of knowledge “0.42” in QMT2. In other words, they cannot associate the formulas they know with the problem in parallel with their knowledge due to the unrelated level of knowledge of 0.20.

The positive scores (APS) obtained in QMT1 and given in the second row of Table 2 show the positive knowledge levels of students on work and energy problems. It can be seen that students' positive knowledge level is on a medium level (0.25≤APS≤0.59). The fact that students' positive knowledge level in the process step of QMT1 is higher than all other levels of QMT1 indicates that the students are focused on the solution. It can also be seen that QMT2 does not reflect the knowledge levels of 0.73 to the positive knowledge levels of QMT1 in FBD and formula steps. This can be explained by the fact that students are focused on the solution. The students who focus on the solution and have a knowledge level of 0.73 from QMT2 have a low level of mathematical logic of knowledge, - 0.27 in QMT3; this shows the logic of these formulas. This may be the reason for not exceeding positive knowledge score of 0.59. Correct (NAPS) knowledge levels found in negative stages can be added to positive knowledge levels, as well. NAPS knowledge levels (0.05≤NAPS≤0.12) in all steps of QMT1 are significantly low.

Negative scores (ANS) obtained with QMT1 and given in the third row of Table 2 show the students' negative knowledge levels about work and energy. It can be seen that students' negative knowledge levels are low (0.14≤APS≤0.24). Low levels of negative knowledge indicate that less time can be devoted to misconceptions of concept-formula-knowledge in educational processes. The success levels of the students are given in the last line of Table 2. The ASS score sows the students’ level of success in work and energy. The students' success level is on a medium level, as it has a score of 0.65. It is noteworthy that the success levels are higher than the positive knowledge level (APS) in the process level of QMT1. Achieving more success levels with less processing accuracy indicates that students carry out certain operations with their minds without writing. The fact that students have low levels of knowledge in the I-O, FBD and formula steps also shows that they focus on the result and therefore execute certain operations with reason without writing. This indicates that their students have more potential than measured at both their knowledge and achievement levels.

The level of knowledge and achievement obtained in this research is identified as moderate both in the study conducted with university students in similar teaching processes; teacher candidates having difficulties in the items that should bring together certain knowledge (Aydın and Özgeldi, 2019) and that students having difficulties in understanding basic relationships and formulas (Tan Sisman and Aksu, 2016) show that university students have problems in their previous education experience (Tapia et al., 2019; Tapia et al., 2019).

Models are developed for problem solutions so that problem solutions can be better understood by students and constructive contributions can be made to those who carry out teaching processes (Roux and Kloot, 2019; Salloum and BouJaoude, 2019; Öllinger et al., 2015). In addition, evidence of the positive contribution of these models has been obtained (Roux and Kloot, 2019; Salloum and BouJaoude, 2019). However, it has been conferred in the evidence that modeling created with causal mapping in the solution of complex problems is not effective in students' problem solving (Öllinger et al., 2015). This evidence shows us that care should be taken in developing models. In modeling the problem solving steps, it may be a good approach to develop a model with priority-recency relations that enable the establishment of the semiotic model. The relations shown in the theoretical SPKM, which was established with the priority-recency relations of the problem solving steps in the introduction section, can be established through experimental SPKM by drawing on the same model again by using experimental findings. Experimental data show the relations that students actually use and the priority-recency orders they use in these relations. Experimental SPKM can be established with students' positive knowledge levels. In Table 2, where the findings obtained from the data collected from 34 science teacher candidates with qualitative method are given, the experimental SPKM developed using the lines where the positive knowledge levels of the students are shown in the method section (Figure 2). They used the relations given in the theoretical model at an intermediate level, since all the positive knowledge levels of the students in

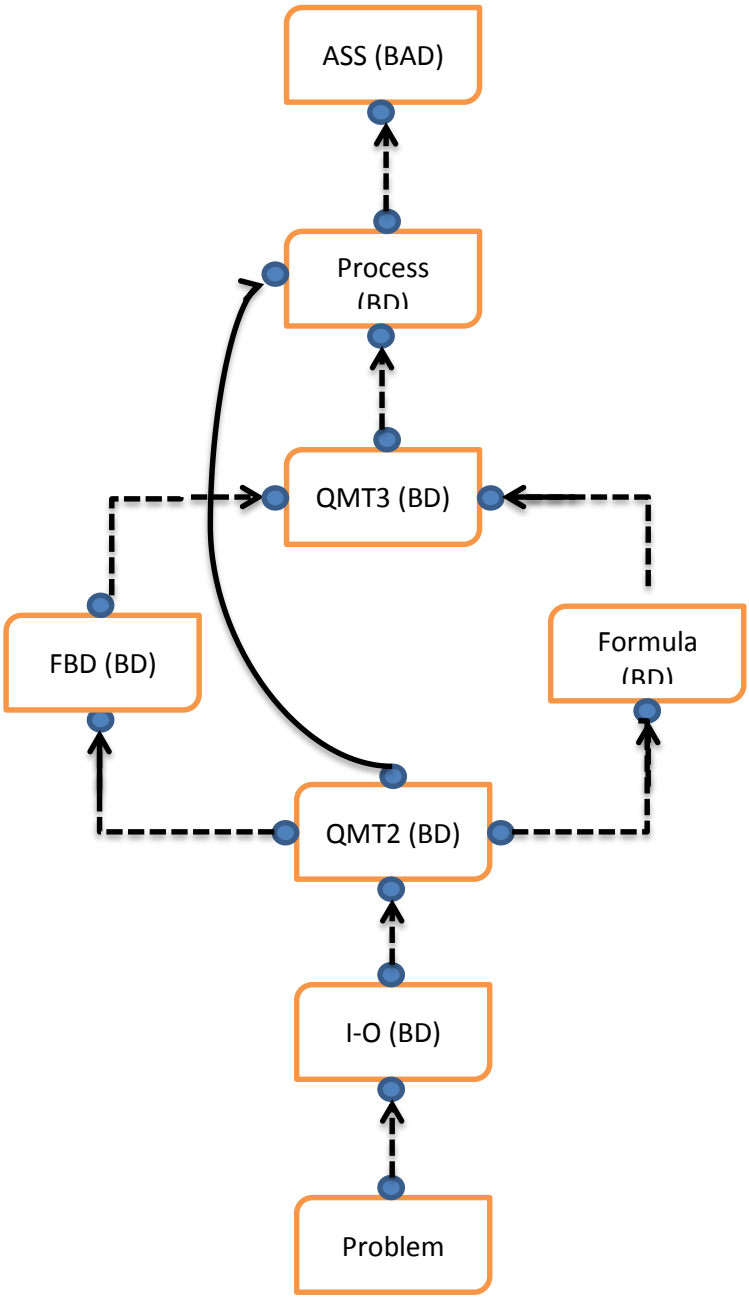


Figure 2. Experimental SPKM.

the second row of Table 2 remained between 0.1 and 0.7. Experimental data show that there is a new relation that is not directly shown in the theoretical model. The fact that the knowledge level determined by the students with QMT2 is greater than 0.7 and that the highest positive level of knowledge in the steps of the PST is obtained in the process level shows that the students usually make a problem solution by establishing a relation between these steps. The use of other levels at a medium level may be the reason for the success levels to remain at a medium level (0.65). It can be said that the SPKM given in the above figure provides a holistic meaning to the students both in where they experience problems in problem solving and in what level they can

use the relations between the steps. This can both help a student to better realize his or her academic level, and other elements of education to see the student's academic status more holistically.

With the data collected through this study, it can be said that students have a medium level of positive knowledge at all levels of the PST and can establish a stronger relation between the formula knowledge level determined by QMT2 and the process steps. In other studies with first grade science students, positive knowledge levels were found to be low in the steps of the PST (Yılmaz, 2016a, b). Also in these studies, it was found that the relations between the knowledge level of the formula and the process step determined by the QMT2 in the semiotic knowledge models of the students were higher than the other relations. Based on these results, it can be said that the students studying in the first grade of science teaching focus more on the solution than understanding the problem and this focal point negatively affects their success levels. The fact that students focus both on the solution and their level of success shows that they have the potential to establish a medium level relationship between their scientific knowledge and technology.

DISCUSSION

The positive level of knowledge and achievement of the students shows that the level of problem solving should be developed. Since collaboration has positive effects on students' problem-solving approaches (Birisci, 2017; Suarsana et al., 2019), problem-solving activities that they can collaborate can positively affect students' level of knowledge and sucess. Since problem solving skills (Latifah et al., 2019) and metacognitive awareness of procedural knowledge can be increased with the problem-based learning model (Kuvac and Koc, 2019), problem-based learning model can be used to develop positive knowledge levels. Given that visualization technique improves problem solving success levels (Osman et al., 2018), when visualization and modeling of problems affect problem solving successes (Roux and Kloot, 2019; Öllinger et al., 2015), establishing semiotic models of problem solutions can positively affect students' success levels.

The positive knowledge level of the students is the two lowest PST levels, I-O (0.25) and FBD (0.26) levels. In order to increase the knowledge level of students in the I-O step, they can spend more time to understand the question by breaking it into separate parts, provided that time efficiency is enabled in the other steps. There may be more than one reason for the low level of knowledge in the FBD step: not focusing on the solution and devoting enough care and time to this step; not being able to establish relationships between variables, having problems in shape drawings, etc. Collaborative learning strategies can also be used to alleviate the difficulties experienced in the FBD step, since collaborative learning strategies provide positive results in alleviating the difficulties experienced by students (Adeyemi and Cishe, 2017).

Findings obtained in this study show that the first-year students participating in the study have positive procedural knowledge and success levels. Positive knowledge and success levels of these students should be increased, as well. Students' intermediate procedural positive knowledge and success levels can be improved by providing support for students in specific areas. Due to the dynamic relationships of procedural knowledge and the positive effects of question-based activities in understanding the concepts (Zoupidis et al., 2016) or the positive effects of question-based teaching in the development of learning objectives in science education (Vorholzer et al., 2020), these activities can be used to improve the levels of procedural positive knowledge and success. Since creating more than one solution for problems increases students' sense of competence and can be indirectly affected by their procedural knowledge (Achmetli et al., 2019), activities in which more than one solutions of problems can be developed in order to increase their positive knowledge and success levels.

QMT1 is formed from questions in which students' knowledge and success levels can be determined in scientific knowledge and technology applications. In addition, since it can bridge the questions and problems with science and applications, it shows the potential of students to establish a relation between science and technology in the findings obtained from the PST method. In the basic measurement tool, the positive knowledge levels of the students in all the stages of the PST being on a medium level, including the medium level of success indicates that their potential to establish a relation between science and technology is on a medium level, as well.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Challenges facing continuing professional development (CPD) of academic staff of the colleges of education in Ghana

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Professional development is critical in the life of every organization in positioning workers to meet changing trends of globalization. This study seeks to look at a critical analysis of the challenges facing Continuing Professional Development (CPD) of academic staff of the colleges of education in Ghana. The exploratory, descriptive and evaluative case study approach that combined both qualitative and quantitative methods were used which basically adopted the questionnaire and the interview schedule in the collection of data. The census and the purposive sampling techniques were used in collecting data from 364 respondents constituting tutors, Human Resource Management and Development (HRMD) committee members and chairpersons, vice-principals and quality assurance officers. Primary data collected through the instruments used were analysed using the mean and standard deviation techniques. Text analyses were also done for the interview schedule data. The results of the study revealed that colleges of education do not maximise the full potential of benefits that accrue from CPD programmes due to some profound challenges such as lack of a systematic and comprehensive training needs analysis and weak interaction between the institution seeking the training and the institution providing the training. The study recommended that CPD programme be linked to the learning needs analysis and integration of knowledge with everyday practice. Management of colleges of education must endeavor to have an appraisal system linked to personal development planning of tutors.

Key words: Challenges, continuing professional development, colleges of education, training, development.

INTRODUCTION

Professional development is critical in the life of every organization in positioning its human resources to meet changing trends of globalization. Human resource (HR) is the organisation's most crucial resource whose behaviors, talents and aspirations affect the other resources that the organization uses, the organizational efficiency and its effectiveness (Agyenim-Boateng, 2008). DeSimone and Harris (1998) as cited in Owusu (2011) put it that "people are an inimitable asset and that their skills are one thing that competitor organisations cannot

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imitate" (p. 1). It can be deduced from many reports that the competitive strength of companies, social organisations and countries are no longer strictly tied to physical assets or resources, but to the intellectual attributes of their knowledge workers. This was confirmed by Dixon and Hamilton (1996) when they upheld from their analysis that HR constitutes between 40 and 80% of wealth worldwide while natural resources are only a little more than 10% of wealth in most parts of the developing world.

Now, the argument is that after expending a considerable outlay of the organisation's efforts to obtain suitable employees, works that organisations have to do are to ensure that human resources are maintained, refined and utilised. These are achieved through adoption of systematic approach to training and development (T&D) of staff which invariably per its orientation has metamorphosed to a new concept currently referred to as continuing professional development (CPD). The need for such approach emanates from the fact that survival and growth of organisations in a constantly changing and increasingly complex environment depends on the existence of observed and nurtured knowledge and skills.

CPD of employees is an issue that has to be faced by every organization. The quantity and quality of training carried out may vary from one organization to another. Cole (2002) has outlined some factors that influence the quantity and quality of training and development activities to include: degree of change in the external environment (For example, technological change, new legislation amongst others); degree of internal change (For example new processes, new markets, etc.); Availability of suitable skills within the existing workforce; adaptability of existing workforce; the extent to which the organization supports the idea of internal career development; the commitment of senior management to training as an essential part of the economic success; the extent to which management sees training as a motivating factor in work; and knowledge and skills of those responsible for carrying out the training.

In educational context, the European Union as cited in Newman (2013) opined that "within educational institutions, teaching professionals are the most important determinants of how learners will perform; and it is what teachers know, do and care about that matters" (p. 1). It could be deduced from the European Union's assertion that the indispensability of the human capital (staff) of the colleges of education (CoEs) cannot be overemphasized in the governance structure. A regular investment of time in learning and development should be seen as an essential part of professional life, not an optional extra, with learning an integral part of work (Owusu, 2011). However, no matter how well qualified or successful the professional may be, further development is always necessary.

Ghansah (2009) in making reference to the three eras in the economic history of the world believed that with the emergence of knowledge-based economies, human capital had become a significant source of wealth for individuals and organisations. This reflects equally in Schultz (1994) assertion as cited in Afreh (2018) that "the knowledge and skills which people bring to their jobs as a result of their education and training, should be regarded as a form of capital which is capable of providing returns and therefore requires investment to develop" (p. 3).

Assessing needs for HRD

For organization to meet the needs and aspirations of CPD, there is the need for an indebt assessment of peculiar needs, aspirations and directions of an organization. The concept of need according to DeSimone and Harris (1998) typically refers to a discrepancy between what an organisation expects and what actually occurs. Gilley et al. (2002) further stress that it is useful to think of need as a gap between a current set of circumstances and some desired change or desirable set of circumstances. Discrepancies may become the foundation of a training or CPD need. Needs identified in this sense may help focus on correcting substandard performance and in some cases, a CPD intervention such as coaching or skill training may be necessary to correct the discrepancy.

Noe (1999) as cited in Owusu (2011) postulated that need assessment typically involves organisational analysis, person analysis, and task analysis. Organisational analysis involves considering the context in which training will occur. It determines the appropriateness of training, given the company's business strategy, its resources available for training and support by managers and peers for training activities. Person analysis helps to identify who needs training and what kind of training they need. It involves: determining whether performance deficiencies result from a lack of knowledge, skill, ability (a training issue) or from a motivational or work design problem; identifying who needs training; and determining employees' readiness for training. Task analysis is the first most criteria that helps in identifying critical knowledge, skills and behaviours demands for training of employees with knowhow to complete their tasks.

Finally, Ampomah-Mintah (2017) studied how management T&D needs are assessed in Libyan industrial companies and the criteria used in selecting trainees for management courses. Data was collected through the administration of questionnaires and interviews with managers. It was revealed that the techniques used were mostly dependent on indications from performance reports and the views of supervisors. It was discovered that administrative functions were practiced without regard to acceptable standards and decisions related to management were mostly dependent on personal relations, family ties, tribalism, nepotism

among others rather than established procedures.

Performance appraisal as an essential component in CPD

Management must take decisions on employee remuneration, transfer, promotion, discipline as well as CPD. Due to the importance of these personnel matters, organisations attach great importance to the official assessment which management make on their employees. To this end, performance appraisal has occupied the attention of human resource management, organizational behavior and industrial researchers.

To start with performance appraisal is essentially a formal mechanism of reviewing individual employee performance. Performance appraisal which is variously termed performance review, annual appraisal, performance evaluation, employee evaluation and merit evaluation is an on-going process of evaluation which gives management the opportunity to measure both the behavior and outcome of employees in the workplace, collection and analysis of data on the overall capabilities and potentials of individual worker in an attempt to make decision in tune with a purpose (Agyenim-Boateng, 2008). Thus, it could be deduced that basically performance appraisal can be conceptualized as "activities through which organizations seek to assess employees and develop their competence, enhance performance and distribute rewards" (Fletcher as cited in Agyenim-Boateng, 2008).

Evaluation of training and development programmes

Given the importance of training programmes, one might expect that HRD programmes are regularly and carefully evaluated. Many articles have been written about the importance of conducting evaluations, but more organisations pay lip service to evaluations than actually conducting them. Gilley et al. (2002) intimated that successful training programmes must meet specific learning objectives, measure the effectiveness of learning specialist and the competencies of programme design. The question is: did the training programme enable the learner to develop adequate knowledge, skills and attitudes in order to close the gap between 'what is' and 'what should be'? Again, why is not evaluation done more frequently? There are several possibilities. Evaluation processes require time, resources, procedures and expertise, thus making it difficult to indulge in.

On the basis of a research by Manghan and Silver as cited in Owusu (2011) which suggest very few of organisations assessed the full cost of training activities and therefore were unable to evaluate the benefits. This is supported in a study of 80 of the largest business organisations in the United Kingdom in which Hussey as cited in Owusu (2011) found that only 33% of the respondents felt that their organisations evaluate CPD programs.

Several studies have been conducted on the benefits of CPD in the universities. For example, in a study conducted by Chikari et al. (2015) on lecturers' views towards performance on private high educational institutions in Botswana. They found that lecturers viewed CPD as a panacea for professional growth, efficiency and teaching effectiveness. They recommended that CPD implementation is essential and required stakeholder involvement. Another study by Melesse and Gulie (2019), on teacher CPD and its impact to quality in education in Ethiopia. They found out that CPD implementation helps teachers to access new ideas, share experience and engage in professional interactions. A similar study conducted in Ghana by Mensah (2016), examined the influence of teachers CDP on their classroom practices. Their findings revealed that CPD programmes were relevant to teachers' classroom management practices, hence capacity building programmes should be promoted regularly in basic schools.

With CPD importance to performance of teachers in educational institutions, there was need to conduct studies in CPD in the CoE. However, little is known about CPD in the CoE in Ghana. Therefore, this study wants to assess what criteria are used in selecting staff for CPD activities and what are the challenges facing CPD programs in the CoEs?

METHODOLOGY

The study used an exploratory, descriptive and evaluative case study approach that combined both qualitative and quantitative methods (Blaikie and Yin as cited in Agyenim-Boateng, 2008). The population of the study comprised all tutors and assistant tutors; committee members responsible for HRMD and their chair persons as well as vice-principals in the CoEs in the Eastern-Greater-Accra (EAGA) sector. Traditionally, the CoEs had been grouped into seven zones. The EAGA sector of that stratification comprised seven colleges representing 17.39% of the entire CoEs. To ensure representativeness, all the eight colleges found in the EAGA sector were used for the study. There were 371 respondents composed of 355 tutors for which 63 equally serve as HRMD committee members and chairpersons, 8 vice-principals and 8 quality assurance officers.

The tutors as well as the HRMD committee members did not require any sampling technique but the census approach was used in selecting all of them whereas the purposive non-probability sampling technique was used in selecting the HRMD chairpersons', vice-principals and the quality assurance officers. There was however, a return rate of 364 representing 98.1% of the total respondents used for the study. Two instruments (questionnaire, interview schedule) were used in the data collection. The questionnaire was used for all the teaching staff as well as the quality assurance officers. The questionnaires were personally distributed in all the 7 colleges with six trained tutors who served as ambassadors in the various colleges. A structured interview schedule was used for the HRMD committee chairpersons to elicit information basically on varying issues that bother on the study that actually emanated from the questionnaire that needed further

Table 1. Criteria used by the Colleges of Education in the selection of staff for CPD programs.

Criteria	N	Mean	Std. deviation
National / Departmental Policy	364	1.8246	0.4478
Mandated	364	1.6411	0.5887
Career progression	364	1.6314	0.5002
Personal development plan	364	1.4430	0.7525
Interest	364	1.2981	0.3995
Discussion with colleagues	364	0.4285	0.4708
Client's response and feedback	364	0.3899	0.4548
Formal needs assessment	364	0.2657	0.4428
Knowledge/skill gap	364	0.2415	0.4291
Reflection on performance	364	0.1498	0.3577
Appraisal	364	0.0000	0.0000
Performance review	364	0.0000	0.0000

Source: Field Data (2017).

clarifications as well as documentary evidence of CPD situation in their respective colleges. The interview was personally conducted by the researcher. The study used the mean, standard deviations as well as percentages in analyzing both research questions.

RESULTS AND DISCUSSION

Criteria used by CoEs in selecting staff for training

Results on criteria considered by CoEs in CPD development programmes were assessed and the results shown in Table 1.

In sharp contrast to what literature stipulates in relation to the selection of staff for CPD activities, the results from Table 1 deviates from the established norms and standards. For instance, it could be seen clearly from the mean as arranged in a hierarchical order in Table 1 that the criterion that had mostly informed and influenced CPD activities in the colleges was national/organizational policy. The Colleges of Education Act, 2012 (Act 847) stipulates through the statutes that the minimum qualification requirement for teaching was a master's degree. It was therefore incumbent on teaching staff to up-grade their respective qualifications to meet the new organizational requirement. In as much as this was a national policy and an organizational requirement, it should have been executed taking into cognizance the factors that necessitated the change in policy. Thus, this policy was executed blindly without any form of formal assessment by management to ascertain how employees were progressing and the sort of improvements necessary to build on their strength and enable them to perform more effectively. This contradicts what literature says that training needs must precede any form of training and development program (Noe, 1999 as cited in Owusu, 2011).

This revelation corroborates literature that the performance appraisal system of the Ghanaian public sector universities did not affect the HRD programmes of the university as they were not fully integrated into the HRD programmes of the university (Agyenim-Boateng, 2008). Compounding the problem of lack of training needs analysis through either a formal or informal appraisal system was the non-existence of an HRMD unit which should have in it a quality assurance component. The study revealed that all the eight colleges used for the study had constituted a Staff Development Committee which was a statutory requirement but only existed in name as it was not functioning. Likewise, quality assurance was left to the whims and caprices of just one individual who virtually had no role to play in staff CPD.

Table 1 further shows that respondents considered 'career progression', 'personal development plan' and 'interest' as the most prominent media through which they were able to determine whether or not CPD was necessary. Owusu (2011) stipulates that career progression', 'personal development plan' and 'interest' cannot override indicators like client's responses and feedback' and 'knowledge/skill gap' which look at training needs of the organization, training needs of the trainee involved as well as career progression. Performance appraisal of teachers in the CoEs should encapsulate responses and feedback from trainee teachers on mentee programs. This is to help improve individual employees' performance in the organization in an attempt to improve the overall organizational performance and effectiveness.

The on-going analysis from Table 1 seemed to stipulate that the CoEs did not really have any stipulated criteria through which they were able to identify their training needs for CPD programmes. The situation gives rise to the use of discretionary measures from teachers accessing the program and the danger here is that

Table 2. Summary statistics of challenges by respondents.

Challenge	M	SD
How to create a system of a more valid, reliable and operationally viable measures to evaluate CPD programmes.	3.49	0.59
How to make learning a fundamental value of the institution.	3.70	0.50
Absence of transfer of learning.	3.69	0.53
Lack of major resources and adequate time to CPD	3.57	0.51
How to gain the willing cooperation and support of other line managers.	3.2	0.49
How to link the organisational, operational and individual training needs.	3.49	0.49
Lack of a clear written policy on Training and Development	2.02	0.81
Lack of a systematic and comprehensive training needs analysis.	3.30	0.46
Weak interaction between the institution seeking the training and the institution providing the training	3.55	0.55
Lack of flexible learning provision	3.27	0.53
Inadequate staffing and high turnover	1.87	0.75

Source: Field Data (2017).

training programs may not necessarily meet the organizational needs. Thus, most CPD programs had unfolded in the CoEs without regard to pertinent indicators that will yield the required outcome and expectations. This finding confirms the NAB analysis as cited in Newman (2013) that only 0.01% of the teachers with Masters Degrees in CoEs had qualifications in the relevant subject area. This further corroborates a study by Agnaia as cited in Sharon (2017) that administrative functions were practiced without regard to acceptable standards and established procedures.

Challenges facing CPD practices

Like every other human activities, there is no doubt that the practice of CPD in the CoEs in Ghana were associated with some challenges. The study basically explored how the respondents perceived challenges faced by the Colleges of Education Service in Ghana. Table 2 shows a summary statistic of the responses from the study.

Table 2 shows statistically significant differences were reported on three critical issues: how to make learning a fundamental value of the institutions; absence of transfer of learning from the training to the workplace; and how to gain the support and willing cooperation of other line managers.

Absence of transfer of learning from the training to the workplace was a major challenge facing CPD in the CoEs (M = 3.69, SD = 0.53). Underpinning this challenge is the issue of the unavailability of facilities and other teaching and learning aids that would ensure effective transfer of learning from the training field to the workplace (Owusu, 2011). Adequate equipment and infrastructure are necessary for the provision of quality tertiary education. Without doubt, infrastructure of CoEs needs improvement if the colleges are to live up to their designation as tertiary education institutions. The National Accreditation Board (NAB) as cited in Newman (2013) reported that laboratory/workshop equipment in the colleges were obsolete, inadequate and poorly maintained. The board again indicated that office accommodation for tutors was largely non-existent in the colleges.

The findings of the NAB were affirmed by the NCTE as cited in Newman (2013) which stated that “furnishing in the laboratories is very poor and equipment is not only scanty and paltry but out of date”. Even though some efforts have been made to improve infrastructure and equipment in the colleges, not much has changed since the colleges were elevated to tertiary status. It is more frustrating when one cannot practice and deliver what has been learnt due to lack of facilities or infrastructures. The NAB findings corroborate the work of Tannenbaum (1997) who found that the work environment whether physical, social, or psychological conditions that individuals experience can either encourage or discourage the acquisition and transfer of new skills and ideas. It follows that the focus of every corporate HRD policies and practices should be to create and foster a climate that promotes the successful acquisition and transfer of new skills and ideas. This is the only way that institutions’ HRD programmes would achieve its intended objectives.

In furtherance to the absence of transfer of learning from the training to the workplace, the study revealed that the lack of career counseling center was a major contributing factor. The study suggests that there was a cumulative frequency of 86.2% of the respondents who had never used the career counselling center. Quite a significant percentage of this category of staff was even ignorant of the fact that such a facility even exists. An interview conducted at the Guidance and Counselling (G&C) units revealed the same responses that indicate that there was no career counselling component for staff. In as much as all the seven colleges used for the study had G&C units, the counselling centers offered services for the entire CoEs community. Rarely would you find

tutors patronising such services because there were virtually no programmes that would attract them. All programmes associated with T&D were under the jurisdiction of the T&D unit that was equally non-existent. An interview with some committee heads responsible for staff T&D recorded no career counselling facility exists for staff that embarks on T&D as insinuated by the counselling unit. This explained why the majority said no such facility exists. It was also evident from the interview with the HRMD committee chairpersons that the few respondents who asserted they occasionally patronised the services of the center, did that on their own but not because there exists a facility that was purposely meant to counsel staff members on such issues as further studies. The implication was that most T&D programmes in the CoEs over the years evolved without any form of career counselling.

The indispensability of G&C in every CPD programme cannot be overemphasized and interviewees from all the CoEs used for the study admitted that career counselling for academic staff in the CoE should be a major component of their services. G&C invariably facilitates and helps the process of choosing the right candidate for specific T&D programmes and minimises the occurrence of participants abandoning programmes midstream or causing undue delay in the completion rate that adversely causes financial loss to the respective institutions. The repercussion of the absence of a career counselling facility could be very disastrous to the achievement of the overall organisational objective. For as Hamblin cited in Yadapadithaya and Stewart (2003) pointed out: trainees can react favourably to a course; they can enjoy it but learn nothing. They can also learn something, but cannot, or will not, or are not allowed to, apply it. They apply it, but it does no good within their own area of competence. It does some good in their function, but does not further the objectives of the organisation (p. 118).

It must be noted here that Hamblin's observation indicates that compromising standards and not choosing the right candidate for T&D programme could virtually result in an absence of transfer of learning from the training to the workplace or virtually a total waste.

Table 2 equally reveals that making learning a fundamental value in the CoEs was a major challenge confronting CPD. These were attributed to factors that include lack of commitment from management that may result in institutional bottlenecks in policies, inadequate resources and funds as well as the selection process being discriminatory to others. Owusu (2011) maintains that this could also be laziness or unwillingness on the part of staff due to lack of incentives and other motivational factors. His study indicated that there was no policy provision regarding CPD and any form of reward system. For example, in a response to a question trying to understand why college tutors who are supposed to teach and conduct research as well have not been able to make learning a fundamental value in the institution, the interviewees were unanimous that there were no motivation and available incentives as the following responses indicate *"There are basically two types of CPD programmmes available to tutors in the colleges of education: on-the-job training and off-the-job training. The most common one was the off-the-job type which a number of staff adopted due to the new national policy of master's degree as the minimum qualification required for teaching in the CoEs. Most teachers struggled to bear all the cost involved in their training without any refund upon completion as promised by management. The sad aspect is that, all these sacrifices did not did not influence decisions on promotion and remunerations in any form. A good number of teachers who underwent such CPD programmes retired with virtually no increase and improvement in salary prior to the tertiary status of the CoEs. How can teachers be motivated when all they get are papers in the name of certificates without any corresponding benefit in their personal development? Ironically, our counterparts in other analogous institutions with virtually the same conditions of service have in place juicy packages associated with some of these CPD programmes. Even with the on-the-job training sessions like T-Tel, they will not even serve drinking water not to talk of an allowance. All these are not motivating and subsequently making learning a fundamental value in the CoEs practically impossible and a difficult end to achieve.*

For example, Section (4)(d) of the CoEs Act makes it mandatory that basic research and action research form an integral part of teacher education, the paucity of research capacity in our colleges as result of our background as a non-tertiary institution few years back cannot be glossed over. This provision notwithstanding, the culture of research and publication is nearly non-existent in CoEs even though tutors are not oblivious to the benefits that research accrues to productivity. The reason is simple; research and publication come with huge cost for which the unimproved salary of the college tutor cannot meet. Remember we cannot use all our money on research and publications which comes with no corresponding benefits aside the knowledge to the detriment of our family obligations. In order to ingrain research culture in the CoEs which hitherto was not an institutional requirement, management through other stakeholders must be committed and make conscious efforts of securing allowances and funds for the academic staff to promote research and publication as the culture has been in other analogous institutions like the universities and polytechnics".

The interviewees were unanimous that the challenge of not making learning a fundamental value in the colleges could also be attributed to the difficulty in accessing study leave due to the state of governance structure in the colleges now. Unlike other autonomous institutions like the universities and polytechnics, almost every decision is subject to the approval of the Minister of Education (Act 847, Section 19). Thus, tracing the historical antecedent

of the autonomy and governance structure of the CoEs, it could be deduced that the elevation of TTIs to CoEs resulted in the placement of the colleges under the NCTE. However, there were conflicting roles between the NCTE and the GES with respect to the governance structure in the CoEs. For instance, while the NCTE was responsible for coordinating the budgets of the CoEs; the GES still supervised the pay-roll of the CoEs. His situation adversely affected major decisions in the CoEs including CPD programmes. It must however be noted that, this conflicting role have been resolved to a large extent with some few outstanding issues like autonomy and academic freedom of the CoEs to be addressed. There are institutional bottlenecks in policies and subsequently one wonders how even with the existence of Governing Councils function effectively since most decisions are being dictated by government as well as the University of Cape Coast.

Another challenge that has bedeviled CPD in the CoEs was '*how to gain the support and willing cooperation of other line managers*' (M= 3.62, SD = 0.49). Lack of commitment by government and management of the CoEs to HRD programmes has resulted in an ill-equipped HRD unit if even there exist one. This situation has invariably led to the non-existence of a clear written HRD policy which actually has given room to the phenomenon of discretion on the part of authorities. Indeed, there is no direction as to what, how, and when? CPD activities must be organized (Owusu, 2011).

As a rippling effect, authorities were in a state of dilemma as to whether to be committed to cultural expectations or management governed by organisational ethics. Thus, for the purpose of maintaining good relations with colleagues, relatives and other family ties, it becomes very difficult to get the support and collaboration of all stakeholders in ensuring that stipulated management principles were strictly adhered to and respected by all without compromises. This finding validates Agnaiaas cited in Owusu (2011) observation that administrative functions were practiced without regard to acceptable standards and decisions related to management were mostly dependent on personal relations, family ties, tribalism among others rather than established procedures.

There is also the issue of '*lack of a systematic and comprehensive training needs analysis that results in weak interaction between the institution seeking the training and the institution providing the training'* (M = 3.55, SD = 0.46). Lack of a well-established and resourced HRD unit had also contributed to this challenge. 85% of the respondents agreed that there was no training needs analysis conducted before any CPD programme. In most cases the individual teachers opt for programmes based on their own interest and career progression which may not be consistent with the organizational goals and vision. This is in sharp contrast with the findings of Owusu (2011) which equally supports the work of Noe as cited in Owusu (2011) who determined that a systematic and comprehensive training needs analysis is a pre-requisite to any successful CPD programme and that it is the single medium through which human resource needs are articulated. As a matter of fact, they put it that training needs analysis is the starting point of any CPD programme.

The situation makes it difficult and practically impossible for the CoEs seeking the training to liaison with the institution providing the training to design programmes tailored to solve practical classroom challenges that will enhance performance. It was therefore of no surprise when data from the NAB indicate that most teachers with advanced degrees that were all obtained whiles on-the-job had no bearing and relation on what they were teaching. Thus, the data showed that only 0.01% of teachers with advanced degrees in the CoEs have qualifications in the relevant teaching areas (NAB as cited in Newman, 2013).

Another major challenge which emanated from the study as shown in Table 2 was '*how to create a system of a more valid, reliable and operationally viable measures to evaluate CPD programmes (M = 3.27, SD = 0.59)*'. The study revealed that a cumulative frequency of 83.4% of respondents intimated that no form of evaluation was done about CPD programmes whether before, during or after to ensure their usefulness and appropriateness in order to inform future and subsequent programmes. Only a minority of 16.5% alluded to the fact that some form of evaluation was conducted occasionally and that was after the programme. This is in contrast with a study by Al-Athari and Zairi (2002) which revealed that evaluation of training interventions was done occasionally.

Many articles have been written about the importance of conducting evaluations, but more organisations pay lip service to evaluations than actually conducting them as indicated in the case of the CoEs. Pertinent questions should be asked to ascertain the desirability and suitability of CPD programmes. These questions may include whether the training programme enabled the learner to develop adequate knowledge, skills and attitudes in order to close the gap between 'what is' and 'what should be'? It therefore became prudent that the study verifies and determines why the colleges are not frequently evaluating their training programmes as done in other corporate organisations. The study therefore revealed that evaluation was a cumbersome process that required a lot of procedures, time, resources and more importantly expertise. In summary, it was identified that about 90% of the CoEs that were used for the study lacked the requisite human and material resources for an effective evaluation of CPD programmes.

Another all-important challenge that CPD faces in the CoEs as indicated in Table 2 was '*lack of flexible learning provision (M = 3.49, SD = 0.53)*'. Respondents were unanimous in their response that most CPD programmes both on-the-job and off-the-job programmes were not

enjoyable for lack of flexibility. That is to say, CPD is carried out by adults; hence, all principles that apply to adult learning must be given critical attention to as well. Accordingly, Whitaker as cited in Sharon (2017) mentions as a principle underlying CPD that career development should be owned and managed by the learner. Contrary to this principle as expounded by Sharon (2017), CPD programmes undertaken by tutors from the CoEs were largely owned by the providing institutions and they dictate the pace and the entire modus operandi without any recourse to the participant's status even as an adult.

Amongst the numerous principles that must inform adult learning include the following: CPD must ensure active engagement of all learners which stems from the fact that adults learn best when actively engaged in the learning process; learning must be relevant to their work or some other aspect of their lives, CPD must seek to solve practical problems and not more of theoretical, CPD organisers and facilitators must listen to and respond to learners' needs even while the activity is underway. Efforts must be made in noting their concerns while in their presence (Badu-Nyarko, 2015).

Conclusions

(1) Colleges of Education did not maximise the full potential of benefits that accrue from CPD programmes due to the absence of collaboration between the CoEs and the institutions providing the training.
(2) CPD programs in the CoEs were mostly dominated and influenced by discretionary measures from both authorities and beneficiaries due to the lack of a clear written HRD policy. Indeed, there is no direction as to what, how, and when? CPD activities must be organized.
(3) The culture of learning and for that matter making learning a fundamental value in the CoEs was absent due to a number of institutional bottlenecks in policies as well as unwillingness on the part of staff due to lack of incentives and other motivational factors.
(4) There is no effective evaluation of CPD programmes due to lack of a valid, reliable and operationally viable measures to evaluate CPD programmes.

Recommendations

To improve, refine and equally ensure CPD programmes are maximally effective, this article prescribes some strategies that could be adopted by the CoEs in addressing some identified challenges that militate against successful CPD policy implementation practices.
(1) To ensure active modes of learning, CPD programmes must be linked with learning needs analysis and integration of knowledge with everyday practice.
(2) CoEs must take into consideration that their institutions commitment to CPD should be demonstrated not only in quantitative terms, but also more importantly in its quality. In this context, the study recommends that, Tannenbaum (1997) assertion should serve as a blueprint in the evolution of institutions CPD programmes and human resource development in general. Tannenbaum (1997) states that: "Rather than the amount of training, it is the quality and appropriateness of the training, the supportiveness of the work environment, and the use of appropriate training policies and practices that determine how well training contributes to continuous learning*"* (p. 447).
(3) In order to streamline the selection process and ensure a better succession plan for CoEs, selection criteria must be tied strictly to assessment needs as well as organisational principles and standards.
(4) CoEs must ensure that pragmatic measures are taken for the provision of modern equipments, tools and other requisite facilities necessary for the technological advancement that comes with CPD. This invariably would facilitate proper transfer of learning.
(5) Workers must endeavor to build a CPD portfolio. This can be paper-based, electronic or online and it would be helpful for it to be based on a common template and include annual progress summaries.

CONFLICT OF INTERESTS

The authors have no conflict of interests.

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Ladder of citizen participation: Insights into female student representatives on public university councils in Uganda

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Globally, there has been a campaign to promote participation of females in the entire development agenda in general, but specifically in the higher education sector. Public universities in Uganda have attempted to ensure that female stakeholders are given a platform to participate in leadership and governance of their respective universities, though still seemingly scanty. The study therefore explored perceptions of female student representative participation in leadership on public university councils in Uganda. The Ladder of Citizen Participation was utilised to get meanings and understandings from the perceptions regarding levels of participation. The study deployed a phenomenological research design with unstructured interview, transect walks and letter writing methods and a two-level narrative analysis technique used to capture plots and themes from the narratives. Findings reveal that female students do not have sufficient ground to effectively participate in leadership and governance due to several constraints. The revealed constraints include lack of sufficient leadership capacity, insufficient resources and gender stereotypes. It is therefore concluded that participation of female student representatives on public university councils in Uganda was mere tokenism! It is therefore recommended that the higher education sector should deliberately support female students towards effective participation in leadership. This can be done through building their capacity in leadership and governance and providing sufficient resources to enable them easily pursue their leadership and governance mandate, among others.

Key words: Participation, female students, leadership, governance, public universities.

INTRODUCTION

There is a general trend world over to promote gender and equity mainstreaming in the development agenda, including the education sector. Women representatives of students on university governing councils are among others expected to champion the "gender and equity mainstreaming" concept within public universities (Sperandio and Kagoda, 2010). The same is also premised in Uganda's Universities and Other Tertiary Institutions Act (UOTIA) No. 7 of 2001, where a university council has several functions including being the

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supreme organ of the university and as such responsible for the overall governance of the objectives and functions of the university (UOTIA, 2006). Participation of women in leadership and governance has been a growing concern the world over. There has been a campaign over the years to promote participation of women in the higher education sector (Alomair, 2015; Hora, 2014; Airini et al., 2011; Growe and Montgomery, 2003).This would greatly enhance participation of special interest groups in the leadership and governance of public universities in order to promote gender and equity mainstreaming in operations and leadership of the universities (Sperandio and Kagoda, 2010). The scholars further observe that several women representatives of students on the university councils have still faced challenges since women's contribution is undermined and less expected. The study therefore aimed at exploring the lived experiences of female student representatives in public university councils in Uganda, specifically the levels of their participation.

LITERATURE REVIEW

McCarren and Goldman (2012) promote that the world over there has been a lot of stereotyping on feminism in leadership positions across the board. However, various scholars posit that women display a lot of attributes in leadership, reason why they should be encouraged to effectively pursue leadership and governance. Mohr and Wolfram (2007) assert that women's feminine leadership style could be rewarded because it is in line with gender stereotypic expectations. This positive effect may be mitigated by the mismatch that their role as leaders presents with respect to gender role expectations: even today, the leadership role is still conceived as being a male role, which adds to the notion of perceived incompetence of women in leadership.

Government of the Republic of Uganda has over the years promoted affirmative action especially to give equal opportunities to the different gender groups in all aspects of development, not sparing the education sector (RoU, 2007). At a global level, there has been recurring debate about the issue of student representation in higher echelons of universities, particularly university councils. While there was a clear lack of student representation at the highest level of the universities, gender issues came to the fore in the sense that women representation has always been ignored even when student participation issue was being addressed.

The Universities and Other Tertiary Institutions Act (UOTIA) No. 7 of 2001, Section 38 considers a need to have at least one female student representative on all public university councils in Uganda (UOTIA, 2006). Again, in 2007, the Ministry of Gender, Labour and Social Development developed a Gender Policy, which reaffirmed the need to have female students participating in all sectoral development processes, including education sector (RoU, 2007).

Literature shows that there is still a challenge on effective women leadership especially in higher education (Kent et al., 2010; Growe and Montgomery, 1999; McCarren and Goldman, 2012). There are several barriers that prevent women from achieving their leadership expectations (Sperandio and Kagoda, 2010). These scholars assert that these barriers include male domination in many roles, heavy domestic workloads and reproductive roles for women, lack of self-esteem and self-limiting practices, and a lack of sufficient qualifications in some cases (Sperandio and Kagoda, 2010).This picture provides a comprehensive situation about the barriers that women leaders face in terms of how other gender groupings view women and their possible role in leadership responsibilities. These stories assist us in understanding how female student representatives on public university councils may be viewed by fellow members and other stakeholders in this structure. Similarly, these women leaders could be facing similar challenges which may be affecting the way in which they perform their duties as representatives of students in university councils.

However, despite so many years of debates about the need to address this issue, there is still limited literature on participation of female students in leadership of universities in public universities of Uganda and some parts of the world. Studies have investigated the general picture of women's participation in leadership and governance, without necessarily focusing on female student representatives in governance structures of the universities (Appelbaum et al., 2015; Hora, 2014; Batliwala and Pittman, 2010). Other studies have dwelled on investigating women's participation in leadership of higher education institutions at faculty level, which mainly has appointed officers in the universities (Airini et al., 2011; Growe and Montgomery, 2003). This also tends to imply that such studies left out a unique group of leaders at corporate level, the female student representatives on university councils. Neil and Domingo (2016) also agree with the fact that the majority of studies look at interventions to develop grassroots women leadership or to help women get into formal political positions, unlike the case for female student representatives in higher education institute leadership. The study therefore aimed at exploring the lived experiences of female students who are members of public university councils in Uganda.

Ladder of citizen participation

The Ladder of citizen-participation theory was deemed relevant in this study because it aimed at understanding the levels of participation of female student representatives in public university councils in Uganda.

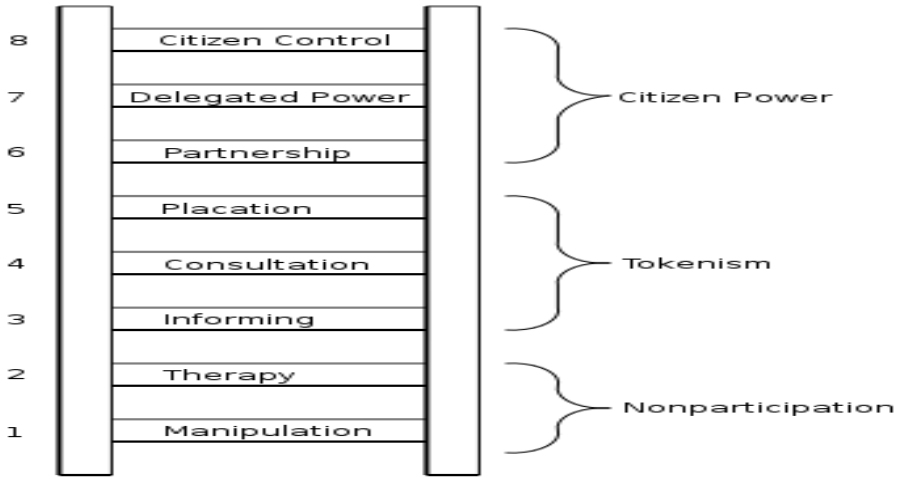

Figure 1. Arnstein's Ladder of Citizen-participation.

The use of this theory enables accurate descriptions of their level of participation in terms of the strand of participation as described by Arnstein (2004). Arnstein (2004) asserts that empowering people enables submission of their views to higher authorities, but only through ensuring effective participation in leadership. The female student representatives required empowerment in order to execute their leadership mandate.

In Figure 1, Arnstein (2004) postulates that if leaders are to participate effectively, the ladder gives a three-strand pattern with eight rungs where the first strand of non-participation comes with manipulation and need for therapy. Therefore, in a nutshell, the first strand is characterised by non-participation. The second strand is tokenism, and comes with leaders accessing some information; undertaking consultations; and placation. Therefore, participation in the second strand shows some improved level of participation where stakeholders (student representatives in this context) have access to some information and are consulted on some important issues affecting the institution. The third strand is citizen power, and is characterised by full empowerment of stakeholders and comes with leading through partnerships, exercising full delegated power and having a lot of control. The Ladder of Citizen Participation helped the study to get an understanding regarding the magnitude of empowerment of female student leaders that enabled them to execute their leadership mandate.

Guaraldo (1996), in support of the Ladder for Citizen Participation, promotes the notion that leaders need empowerment if they are to influence decisions which affect them. Accordingly, Hora (2014) advances that when leaders have the power, they will be able to influence decision-making. This also relates to the postulations under the Ladder for Citizen Participation, which posit that participation is key for effectiveness of leadership and representation. Female student representatives therefore required a lot of empowerment if they were to pursue their leadership mandate. Therefore, the Ladder for Citizen Participation supported the understanding on effectiveness of their leadership through getting meaning from how public universities provided space for the female student representatives to present students' issues for resolution by the respective councils.

The Ladder of Citizen Participation presupposes that participation of people in leadership leads to enhanced empowerment (Arnstein, 2004). In a related argument, participation in leadership and governance may be dictated by the degree of involvement in decision making and whether there is effective information flow (André et al., 2012). This relates to Guaraldo (1996)'s argument that for effective results, leaders ought to be well empowered in order to influence decision making. At higher rungs on the Ladder of Citizen Participation leaders get more involved in decision-making. The Ladder of Citizen Participation therefore assisted the study to get a clearer understanding from the stories captured from the participants about magnitude of opportunity that was given to them to contribute during council deliberations and to follow up implementation of the resolutions. The exercise of power clearly corresponds to the leader's ability to satisfy needs of those they lead and implementation of the interests of their social groupings (Hora, 2014). The argument also advances the participation principle if there is to be effective leadership. According to Collins and Ison (2006), the ladder illustrates the essentiality of participation as a power struggle trying to move up the ladder for more leadership effectiveness. This implies that female student representatives ought to struggle to get more empowerment and influence in the decision making process so that the issues forwarded by fellow students are actually resolved. However, this differs from

context to context since there is no one best way to ensure participation (Connor, 1988). The Ladder of Citizen Participation therefore facilitated the study while trying to draw meaning and understanding of how female student representatives on public university councils were given a platform to participate in university leadership. It is a fair expectation that in some instances due to leadership styles and prevailing situations, the levels of participation of these women leaders would vary from university to university. The use of this theory described their level of participation in terms of the strand of participation.

Participation in decision-making influences and enhances the process of addressing people's needs through allocation of resources and thus, their improved well-being (Paper, 2013). The Ladder of Citizen Participation therefore supported the process of understanding the levels of different female student representatives' participation in leadership and governance. This, in the different contexts of life-world of these women leaders, also gave meaning to effectiveness of the different female student leaders as influenced by the participation platform that was extended by the respective public universities. Similarly, Restless Development (2013), in a related argument, posits that it is important to foster participation of youths in leadership and governance since it promotes the concept from grassroots level. It also builds experience and knowledge of participatory governance from a young age and from the lowest level of community decision-making. In the context of this study, the Ladder for Citizen Participation was deployed to give a better understanding about the linkage between participation levels of female student representatives and effectiveness of their leadership mandate. From their stories, meanings were derived from such participation levels on the female student representatives' leadership capacity. The higher the female student representatives on the Ladder of Citizen Participation, the more the opportunity to pursue respective leadership mandate due to higher participation levels.

MATERIALS AND METHODS

Interpretive research paradigm was deployed in the study and it helped to orient the process of studying the lived experiences of female student representatives in public university councils. Unlike positivists' research which holds that real events can be observed empirically and explained with logical analysis (Kaboub, 2008), the study was underpinned by interpretive research paradigm. Interpretive paradigm holds that it is the people who give meaning to their social world (Phothongsunan, 2010). Phothongsunan (2010) argues that interpretive paradigm is considered as constructivist, naturalistic, humanistic and anti-positivist, which emerged in contradistinction to positivism for the understanding and interpretation of human and social reality.

Qualitative research approach was adopted in this study since the research questions stress identifying the female student representatives; who they are, what informs their identities, their identity as women leaders and their lived experiences as leaders on public university councils in Uganda. Choy (2014) posits that qualitative methods allow the researcher to explore views of homogeneous as well as diverse groups of people, thus helping to unpack their differing perspectives. A phenomenological research design was deployed in this study. According to Lester (1999), the purpose of this design is to identify and clarify phenomena as perceived by the actors in a situation. A narrative inquiry research methodology was deployed since according to Clandinin et al. (2007), it is an old practice that may feel new for a variety of reasons: firstly, it being a commonplace to note that human beings both live and tell stories about their living. Secondly, the lived and told stories are ways the studies create meaning in the lives of their participants.

The study selected the participants purposively by hand-picking five out of the eight female student representatives in five public university councils in Uganda, where authorisation to undertake research was granted. Though representation of students in public university councils has one male and one female student, both represent the entire student constituency and not the respective gender categories and they hold equal voting powers and recognition like other university council members. Purposive selection was used in this study as it allowed the researcher to identify few cases and study them in-depth. Ritchie and Lewis (2014) reiterate purposive selection where members of a sample are chosen with a 'purpose' to represent a location or type in relation to a key criterion. The five participants made representation of the different regions in Uganda that is, Northern, Central, Western and Eastern. Three data generation methods; unstructured interviews, letter writing and transect walks were deployed in this study, where each validated findings from another. The triangulation also allowed reliability of the collected data (Billups, 2014). The data generation methods allowed the participants to answer the study questions which mainly dwelled on their participation as they executed their representation in public university councils. Key questions aimed at understanding the magnitude of participation of these female student representatives. A two-level analysis process involving narrative analysis and analysis of narratives techniques was deployed to derive meaning from the generated stories using the three data generation methods; firstly, telling the participants' stories (narrative analysis) and secondly, the paradigmatic process which allowed recognition of uprising themes that arose from the stories (analysis of narratives). While evaluating the study's worth, Lincoln and Guba (1985)'s Evaluative Criteria as well as Billups (2014)'s Trustworthiness Framework were deployed. Trustworthiness involves establishing four components in the research: credibility, transferability, dependability and confirmability. The study captured perceptions from Anne, Irene, Pauline, Jesca and Stecia (*Pseudo names*).

RESULTS AND DISCUSSION

Study participants had mixed reactions regarding their participation in the pursuance of leadership and governance at their respective universities. While they all indicated that they have space to pursue their leadership and governance mandate, the female student representatives on public university councils in Uganda had reservations on being given sufficient space to deliver student expectations. The study participants raised concerns regarding their ability to participate in leadership, insufficient platform to participate and insufficient capacity to pursue leadership mandate.

Ability to participate

In order to confirm that the female student representatives were able to undertake their leadership mandate, participants in the study were asked to comment about how they pursued their leadership mandate and levels of satisfaction from their student counterparts. Anne indicated that she forwarded student issues on the floor of council and that some of her debates won approval of the other council members. She explained:

I thank God for the tremendous services that I rendered to the students and the entire community of the University as a female students representative on the University Council. During Council meetings, several of my debates won approval of the members of Council and the Chairman, for example when a committee of technology brought a report for the approval of the increment of technology fees, I strongly objected giving reasons why the increment was not genuine. Upon these debates, members including the Chairman did not approve this and the committee members were asked to go and revise their report. I also contributed in making council resolutions for example, payment of lecturers, early release of examination results, election of the new Vice Chancellor and many other duties executed by the University Council, which will always remain on record and am so grateful to God (Anne).

Female student representatives observed that they were able to pursue their leadership and governance mandate at respective universities. They reiterated that they actually provided good representation of their fellow student views to the university council. Irene also explained:

I believe that I make a good representation of students on the University Council because I always take up views from students, which gives them a voice on the highest decision-making organ in the University. I always consulted them, asked for their opinions on various issues that affect them. There have been a lot of issues which students felt should be resolved at Council and I, as their representative have tried my best to make the best presentation on the floor of Council(Irene).

The female student representatives further noted that their constituents, the fellow students, showed satisfaction from their leadership, which to some extent displayed their participation in university leadership and governance. Anne observed: s*tudents usually indicate their satisfaction with my representation on the University Council especially appreciating where I stood my ground for their cause. On several occasions, the Vice Chancellor describes me to fellow students "a young girl that stands in the gap for thousands of students at the University" and I believe the students become happy with my effort.*

This implies that female student representatives in some occasions attempted to present students' issues before council for consideration and they were given platform to present these views. Pauline also reiterated that from successful pursuance of students' issues with council, the students showed satisfaction with the role of their representatives. She explained:

As a female student representative to the University Council, I have good memories as I executed my mandate. This was exhibited with the respect I got from students; for example the students have a positive attitude about Council members, hence making positive comments that have built my self-esteem about leadership (Pauline).

Relatedly, Jesca reiterated that fellow students showed satisfaction with her leadership. She also explained: "*Another wonderful thing is that I got to relate with different students that encouraged me with amazing comments about my leadership and I must say that they have built my self-esteem and that is a fantastic thing. Many say that I inspire them because of my discipline and level of commitment"*.

This illustrates that the female student representatives in university councils actually endeavoured to pursue their leadership and governance mandate. It to some extent indicates that they participate in the leadership and governance of their universities. Relatedly, Stecia explained: "*Generally speaking, students were showing satisfaction about my leadership and representation at Council. During feedback sharing, it was obvious that the students appreciated my effort to submit their issues to the University Council, where several serious matters were actually resolved".*

Anne further confirmed her success during participation in the debate of the university council, where she was listened to and her proposals accepted. She explained:

The Council Chairperson always gives me an opportunity to forward students' issues on the floor of Council. I have been able to undertake my representative role through the several issues presented during budget discussion, which several times is amended to consider student activities and issues. Several students' issues that I have brought before Council have been resolved. For example, when non-teaching staff laid down their tools through a strike, the libraries were locked and students were not getting the services due to them. When Council sat to resolve the issue, I put up a spirited fight until the issue was resolved amicably. Then another case was when the lecturers went on strike and the students missed their

examinations thus, their future not well determined. The University Council intervened through lobbying for funds from the outside and the university resumed its work (Anne).

Female student representatives on public university councils in Uganda reiterated that in the pursuance of their leadership mandate, their focus was on serving their fellow students. This attribute of a leader would definitely promote effective participation in the leadership and governance arena since the people being led would easily endorse their leaders. This explains the concept of servant leadership being a key contributing factor towards enhanced participation of female student representatives on public university councils in leadership and governance. According to Gregory et al. (2004), a servant leader focuses on the people that are led unlike the focus on the self. The feeling of being a servant leader is basically natural where one believes that they truly want to serve others first before leading them (Bowman, 2005). Mccann and Sparks (2018) argue that servant leaders begin with the natural feeling that they want to serve first before taking on leading. The scholars promote that a servant leader should always care for the people that they lead in order to deliver solution to their prioritised needs. From Anne's experience, it should be noted that she had gone through a period of availing herself to serve her colleagues in the pursuance of leadership. In a letter that she wrote to a friend, Anne expressed her experience as a servant leader as follows:

I thank God for the tremendous services that I rendered to the students and the entire community of the University as a female students representative on the University Council. During Council meetings, several of my debates won approval of the members of Council and the Chairman, for example, when a committee of technology brought a report for the approval of the increment of technology fees, I strongly objected giving reasons why the increment was not genuine (Anne).

By being effective listeners, the leadership practices of female student representatives were underpinned by values of servant leadership. Spears (2010) described a servant leader as one who listens receptively to the ones that are led. Anne further explained: "*I was able to relate with my fellow students through the good services that I rendered them since I had pledged service with love. In this I was able to defend their rights and to advocate for their welfare".*

Mccann and Sparks (2018), for instance, argue that in order for leaders to be effective, they should be good listeners. Mccann and Sparks (2018) further argue that people would always appreciate leaders who listen to them carefully, trying to understand what they say while they would not be offended when they are asked for clarity. Leadership on a very large extent depends on interactions between the leader and their subjects since this is what enables relationship building. The argument advanced by the above-mentioned scholars promotes the view that if one is to be a good leader, there is a need to do more listening than talking. In Pauline's narratives, she clearly articulates the view that one of her strategies to succeed in her leadership role was to give audience to the fellow students in order to capture their views while also giving them well founded feedback. She explained:

In order to effectively interact with my fellow students I always undertake my research well to remind myself of their issues and how far they have been responded to. Often, the students look at us negatively especially due to unresolved issues that they may have previously raised. I have always interacted with students through talking to them both as individuals and in groups in a humble manner. I always use these interactions to give the students feedback, while I also capture their views on prevailing circumstances. My interaction with students is always nice since we listen to each other (Pauline).

Effective participation in leadership and governance was also illustrated by the female student representatives since they focused on results. It is important leaders have goals that they want to achieve through their leadership practices. Therefore, results based kind of leadership becomes important. Obiero (2012) advocates the view that if students participate in leadership and decision-making processes at the university, it will be very easy to see them identifying with outcomes of such processes, thus minimises student related administrative problems. Irene was such a leader, who seized the opportunity to participate in the university decision-making process. Along the way, by taking such an approach, she would be giving power back to fellow students, and she believed that it is the only way her leadership would yield positive results. By sharing governance, students feel more positive about university goals and objectives (Obiero, 2012). Irene was given the opportunity to deliberate before the University Council like she explained:

We (the Guild President and I) were respected by fellow Council members; any issue that was to be discussed and passed, our views as student representatives was keenly sought at the Council. Every time I received invitation for council meetings, I consulted my fellow students on what they think I should present on table, and I would do exactly that. This eased my work as I did not always have to figure out everything on my own. Students also felt I always gave power back to them (Irene).

The narratives further indicate that Irene is such a proactive student leader amidst a lot of opposition from fellow Council members. Klemp and Consulting (2008)

posit that leaders need to have a skill of being able to initiate effort through being proactive. By so doing, they drive change through taking risks so as to shape things. The argument concurs with Irene's narrative which stated:

…every time I go to attend Council meetings and try to present such issues, there are only a few council members who may stand with me, saying 'let us give the students what they deserve', but there are those who will be against the whole idea, which causes a state of friction with them. At times I even observe a change in mood of some of the Council members, who may be against the issues that I present before Council. …. However, the Council Chairperson is very cooperative since she has a passion for students and she is a mother herself. Whenever I put up my hand to make a contribution before Council, the Chairperson would always be quick to give me the audience. This has also helped me in the pursuance of my leadership role as a female student representative

According to Klemp and Consulting (2008), if leaders are to be effective they definitely have to set direction and focus on results. Irene is one such leader who, from the narrative, indicates that she has performed her role as a female student representative focusing on achievement of results. She explained; *"I, together with the Guild laid strategies to have several of the issues resolved and implemented by Council and management respectively".*

Caspar and Hall (2008) advance the view that for leadership to be effective, the leaders need to be responsive to their followers' needs. Jesca narrated a story that during her tenure as female student representative in the University Council, she prioritised students' needs by ensuring that such needs were actually responded to. She explained:

I have been very responsive to students' issues by presenting them to the respective responsible parties. I have been very much in contact with the Deputy Principal who is also a member of the Council. Since we have outsiders on Council, I do not present some very sensitive matters there, but I engage management to have them resolved (Jesca).

Confidence of the female student representatives in public university councils further explained their ability to participate in the leadership and governance arena. Rosenthal (2012) contends that confident leaders feel the ability to make their leadership more effective, through displaying a great deal or moderate amount of power as they pursue their leadership mandate. Stecia narrates that sometimes she would face resistance from fellow council members, but she always managed to stand her ground. She explained one of such incidences:

One time when they wanted to postpone a students' urgent request, I emphasised the urgency of the matter and yet council still wanted to leave it pending for quite some time. At that point I stood my ground in favour of students and that's the time I remember getting quite a number of oppositions for quite a time during meetings (Stecia).

Drawing from Stecia's narratives, it is evident that she identified herself as a rather experienced leader who had gained leadership knowledge from childhood and from family. She had over the years grown in self-confidence and she found this to be an invaluable asset in leadership position. She further reiterated that she is naturally committed to leadership and played the servant-leader. Literature (Klemp and Consulting, 2008; Rosenthal, 2012) contends that such a leader would easily gain confidence in the pursuance of her leadership mandate and yet effective leaders must have a level of confidence. If the higher education sector is to promote female student leadership, the female students need to display a level of confidence which may be gained by learning from experience.

One of the factors that influenced female student representatives' relationships with council members was their perceptions of their leadership role. The manner in which participants viewed themselves influenced their leadership practices. Drawing from meanings that these participants attached to their actions, the re-storied narratives indicate that some of the female student leaders see themselves as servant leaders, and such a view influenced their leadership practices. For instance, Anne and Irene emphasised their servant leadership leanings and underpinnings. According to Bowman (2005) servant leadership has attributes also including healing, community and service. From Irene's and Anne's narratives and in keeping with Bowman's (2005) views, the female student leaders were rather concerned about the good health of fellow students. With such behaviour of leaders, these female student representatives won confidence of fellow students, which eased their relationship with them. It created openness where students had a free environment to express their views especially regarding their own welfare as students. This implies that by practicing servant leadership, female student leaders may ensure effective pursuance of their leadership mandate.

Insufficient platform to participate

Female student representatives on public university councils noted that though they had a platform to participate in leadership and governance of public universities; they faced some huddles. They noted that

some of the student demands required funding, which the respective universities would not be able to provide. Anne explained:

I have faced some challenges as I executed my role as female student representative in the University Council. The biggest challenge has been insufficient funding, yet most of the submitted student issues would require money to have them implemented. For example, when we lobbied for the construction of incinerators for the ladies' sanitation, it required a lot of money; procurement of buckets as an option had to wait for some time due to absence of funds; and it only came to pass the previous day. The university, due to insufficient funding, prioritises issues, usually to the detriment of student issues, which are not considered as fast as expected (Anne).

Stecia also noted that on several occasions student issues were not considered at university council due to lack of support from fellow council members. She explained: *"at times I met huddles during Council deliberations when fellow members never supported the student issues that I submitted".* Effective participation of the female student representatives in leadership and governance of their universities was also affected by tainted relationships with other university leaders. In some instances university top management would not extend the due recognition to student leaders, which rather made it difficult for the female student leaders to pursue their mandate like Irene observed:

Our relationship with management has not been very smooth through our leadership mandate. We have always stood our ground and we have always told them that every time we have an issue we make reference to approved University policies, like the students' welfare policies. At times students pay for certain services which are not delivered by the University.

On the other hand, effective participation of female student representatives in leadership and governance of universities is affected by the students being over expectant of their representatives, like Irene explained:

Students always have 101 expectations of my leadership. First of all, they always would not want anything that may disrupt their academic programme. They come to me with issues to do, for example, with tuition payment especially penalties for late payment. I, together with fellow student leaders, find myself pleading for students who have challenges when it comes to timely tuition payment; some students are parents - I am a parent myself; they have dependents to take care of, and thus, they are always one of the last people to pay tuition! (Irene).

Pauline also indicated the challenge of too many expectations from their fellow students, which derailed her effective participation in the pursuance of leadership and governance at the university. Some of the student issues were not very easy to forward to top management and council for successful consideration. She explained:

Students are always so expectant and have a thinking that everything that they may want should be given to them! They expect me, their representative on Council to be able to bring positive consideration of their issues and nothing less. Students' expectations are major regarding academic issues, where they never want to face barriers to their academic success. For example, one major issue that came up had to do with issuance of special examinations if one student may have had an understandable reason to miss the examinations (Pauline).

Jesca also noted that student representatives were derailed by some student issues which were rather technical and required top management intervention. For such issues, the student representatives would have limited authority to effect. She explained: "o*ther challenges where I may not have a hand in solving include technical ones, for instance, in academic issues where a student may have missing marks. The students in this case have to follow up their issues with the lecturers until such marks are recovered".* This further illustrates that though the female student representatives on university councils desired to effectively participate in leadership and governance, they were rather derailed by the limited authority to pursue issues to their conclusion.

Female student representatives were challenged with the problem of negotiating between the higher status members of the university councils, top management and the students they represented. They encountered problems because it seemed that their concerns were not given the highest priority by the university councils and there was a need to be assertive in a situation where women have been required to be deferential to men and other council members. The female student representatives therefore had to learn how to assert themselves in a new way. What helped them to do this was the servant leader stance that they took and the help of female mentors with higher status in the committee.

Re-storied narratives of the five female student leaders indicate that although structures had been created for them to fully participate in decision-making processes of their respective public universities, practices did not automatically follow suit. In other words, leadership practice in those structures is influenced by a number of factors some of which are located within the participants themselves while others lay in the environment outside. For example, female student leaders were given a platform to exercise leadership mandate on behalf of their constituency. However, these platforms came with a few challenges which could undermine their participation and opportunities to make a contribution to leadership of

public universities in Uganda.

Female student leaders that took part in this study understood their mission and that they in general had been marginalised in the past and their existence was largely ignored when decisions were being made. Therefore, when they were elected to these positions, they had developed a clear understanding that they had to fight for the rights of other students. The Ladder of Citizen Participation provided an effective analytic tool to understand and locate their level of participation in their councils. Being aware of the task at hand, female student leaders fought for the highest level in the Ladder of Citizen Participation, namely, the Citizen-Power. The Ladder of Citizen Participation Model as advanced by Arnstein (2004) advocates for full participation at Citizen-Power level. The lower level (Tokenism) is not regarded as meaningful participation and so is Non-Participation which is the lowest level in the Ladder of Citizen Participation framework. Irene can be regarded as the epitome of such ideal leader who utilised opportunity provided for them to participate in leadership and governance at her university. For Irene therefore, it meant that she had to always ready herself before interactions with fellow council members in order to effectively share students' issues. With the platform given to Irene, there was evidence that the university encouraged participation of female students in its leadership and governance, which led to effectiveness in resolving student issues. This is in support of the Ladder of Citizen Participation, which contends the more individuals are allowed to participate in leadership, the more the effectiveness and empowerment they become (Arnstein, 2004). Furthermore, there were cordial relationships evident from the female student representatives' narratives. Anne contends that the platform was open to participate during council deliberations.

Gathering evidence from the re-storied narratives, female student representatives on public university councils studied had a cordial relationship with fellow council members. Anne's re-storied narratives indicated that before joining council, she had a fear that it would be difficult to relate with fellow council members in a male-dominated setting and with older and experienced members. The understandings drawn from the narrative may confirm that this particular society still had stereotypes which informed young women to never expect themselves to be part of high level leadership of an institution, especially higher education institution. Anne noted that unlike the earlier fear of facing difficult times to interact with fellow council members, contrary to her expectations, she was received with very warm welcome from the members. One of the understandings to be drawn out of the narrative is that this particular council's membership had demystified the stereotypes that leadership was a preserve for the males only, and therefore, that other gender groupings should not be welcomed. This led to the view that even the 'young' female student representative were always given priority to contribute during council meetings.

Drawing from Pauline's story about how she related to fellow council members, one is left with a feeling that unless one demands meaningful participation in leadership structures, one cannot effectively pursue one's leadership mandates. In terms of the Ladder of Citizen Participation, Citizen-Power is the ultimate ideal wherein meaningful participation can be realised. Using this conceptual framework, coupled with servant leadership practices, female student leaders may find it easier to pursue their mandate due to servant leadership which brings leaders and followers closer together. By the level of humility that Pauline displayed in her leadership tenure as a female student leader, she would easily forward student issues to high level university organs including council until some would be resolved to the delight of fellow students.

Insufficient capacity

Pursuance of leadership and governance was not an easy sail through. Female student representatives on university councils noted that they faced a challenge of insufficient capacity in terms of resources and personal capacity in leadership, which may have led to ineffective participation in leadership and governance of their respective universities.

Regarding resource capacity, the female student representatives on public university councils indicated that they always faced a challenge to handle student issues which required financing. Stecia noted that student leaders were not being sufficiently funded, which derailed pursuance of their leadership and governance mandate. She explained that student leaders find themselves looking for money from elsewhere in order to handle fellow student issues. She noted:

The Guild never had sufficient resources, yet at times, we were required to travel on University activities in order to solve student issues. At times I would find myself digging deep into my pocket in order to respond to students' needs for example when the DSTV subscription would expire yet they wanted to watch soccer (Stecia).

On several occasions, student issues were not being considered by university councils, reason being that they were not on agenda! This derailed effective participation of female student representatives in leadership and governance of respective universities like Anne explained:

When students' views are not considered just because the issue was not on agenda and priority would be given to other issues on agenda - -so I would only sit and burn

with a lot of passion for the dear students. Then at times there are arguments that bring about a tense environment in the Council Hall, which is not an interesting scenario (Anne).

Among challenges are poor communication, bureaucracy and red-tape, and poor time management, which can only be remedied by building the capacity of the female students in leadership. Pauline explained:

We as student leaders have had a challenge of poor communication. The flow of information from students to staff, Management and Council has not been very effective. This at times has even led to student demonstrations, yet when you analyse the situation, it might be because of misinterpretation and poor communication. Relatedly, the bureaucracy and red-tape at the University may also lead to strife since an issue may delay resolution due to the fact that it has to get approval of several role players. In such circumstances, the students look at me as a representative who has failed them in those aspects (Pauline).

Female student leadership in public universities would require the female leaders to have some level of leadership capacity due to the leadership context and amidst a chaotic environment. Some students were rather provocative and non-appreciative to their representatives, like Jesca pointed out: "t*here are students who are very provocative and will say things like; "this guild has done nothing for us". These would try to get the worst out of you, yet it would only be propaganda which is not of any relevance.* These challenges derail effective participation of the female student representatives in pursuance of leadership and governance of their respective universities.

The study participants also indicated a challenge of poor time management, yet time management is another key attribute for an effective leader, Pauline noted that fellow student leaders never minded about time, which was rather disturbing. She explained: "*One other disappointment during my leadership tenure as a female student representative is when we go for the Guild Representative Council meetings. Deliberations may go on until very late yet it would be because of some members derailing the meeting".*

Many stakeholders still perceive women and specifically female students to have insufficient capacity, as compared to their male counterparts, and thus would better be responsible for other roles unlike leadership and governance. Jesca further reiterates that stereotyping had remained a big challenge that derailed effective participation of female student representatives in leading and governing respective universities. She explains:

To be honest, it has not been a smooth journey due to the fact that I am a female student representative. People expect so little from a female leader because they think we are vulnerable. I have been undermined before I even do something by my fellow colleagues or even people who I have just met and they also say that my position is just ceremonial and it has been challenging to change their mind-set (Jesca).

The meanings and understandings from the re-storied narratives of the female student leaders indicate that relating with fellow council members was also influenced by levels of leadership capacity and experience. Irene narrated that she found it easy to relate to fellow council members because of the opportunity to have several women leadership role models to whom she looked up to. In other words, relationships were not only shaped by what female student leaders did, but also by what they experienced as reception from their senior counterparts. Irene cited her experiences working a variety of senior people at her university such as the Dean of Students, all of whom were characterised by positive energies, and these were duly reciprocated. For instance, she narrated her story about what she had learned from several women leaders including the Dean of Students, who also happens to be the Chairperson Mothers' Union at her church. She had found her to be a mother figure and during the time when they were preparing for elections before getting into positions they occupied as student representatives, she explained that she and others were encouraged to participate in the elections. She and others were inspired by her and their attitudes were shaped by such encounters.

Conclusions

Countries have of late promoted participation of key stakeholders, including the vulnerable groups in all development initiatives. The higher education sector in Uganda also promotes affirmative action regarding involvement of female students in the leadership and governance of respective public universities. The study concludes that participation of female student representatives in leadership and governance of respective universities is premised under the 'tokenism strand' of the Ladder of Citizen Participation Model. Despite the affirmative action towards promoting more participation of female students in leadership and governance of their respective higher educational institutions, they still faced a lot of constraints. They are not given sufficient platform to submit student issues before the floor of University Councils; they lack sufficient resources to support their leadership mandate; on the other hand, female student representatives also face harsh treatment from some sections of their constituents – due to student strikes and student politics. Participants in the study reiterated that they were constrained by

insufficient leadership capacity to match their male student counterparts in an environment dominated by masculinity of leadership stereotypes.

Female student participation in leadership and governance faces constraints including lack of support from top management where at times it disregards submission from the student leaders with reasons of lack of resources to undertake, while at times they just ignores student issues; gender roles for female student leaders which may come with motherhood (for those who may be mothers), and home chores that society may ascribe to women; and in some cases even lack of self-confidence. These factors may further derail effective pursuance of the leadership and governance mandate of the female students in higher educational institutions. These issues tend to reduce the participation of female student representatives in public university councils of Uganda to mere tokenism other than effective participation.

The study suggests that the higher education sector of Uganda should give female students more support in terms of resources and capacity to effectively participate in university leadership and governance. This can be done through extending more finances towards student leaders in order to allow execution of their mandate. Short and long term trainings for the female students, especially in the leadership area, should be sponsored in order to promote their participation in leadership and governance of their universities. University councils and top management need to give a more open platform for student leaders to pursue student issues more easily.

The study however never dwelled on exploring how players in the education and sports sector of Uganda facilitated female student leadership in the sector. Scholars and researchers in the educational leadership, management and policy domain and other scholars from different domains may undertake research on how the sector facilitates or supports female students to participate in leadership. Other studies may also dwell on investigating possibilities that female students may also take benefit of their own in-grown leadership traits in order to grow into effective leaders in higher education institutions.

CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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Critical success factors for public-private partnership in universal secondary education: Perspectives and policy lessons from Uganda

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There is a dearth of phenomenological interpretive studies in public-private partnership (PPP) policy in education service delivery. The limited extant literature on PPPs in education hardly explores insights into how stakeholders understand them, and what they perceive as critical success factors (CSFs) for their implementation in the context of developing countries. The overarching purpose of this study is to explore the stakeholders' perceptions of PPP policy in universal secondary education (USE) and its CSFs in Uganda. It employed the interpretive paradigm and the participants were purposively selected from government bodies, partnership private schools and local communities. Document review and interviews were used as the data collection methods while the resultant data were analyzed using content and thematic techniques. The findings reveal that most stakeholders' understandings of the PPP in USE were diverse and context-specific; and that most school-based stakeholders implemented this policy without clearly understanding its origin, goals and guidelines. While most government-based stakeholders perceived the policy as successful, the majority of school-based stakeholders deemed it unsuccessful. The majority of stakeholders perceived regular policy reviews, commitment to partnership roles, sufficient funding, the selection of partners with adequate capacity, effective policy communication, regular policy monitoring and strong enforcement mechanisms as its CSFs. In view of the findings, it can be inferred that unless appropriate policy reforms and best practices informed by these findings are undertaken, the success and sustainability of PPP policy in USE would remain uncertain.

Key words: Public-private partnership, policy, education, reforms, critical success factors.

INTRODUCTION

Public-private partnerships (PPPs) have gained considerable attention and popularity internationally as innovative management and financing models for public service delivery and modern infrastructure development for sustainable development (Patrinos et al., 2009; Babatunde et al., 2012; Ginsburg, 2012; Verger and

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Moschetti, 2016; Kim, 2017; Badasyan and Riemann, 2020). PPPs enable public and private economic sectors to pool their strengths and expertise within their respective efficiencies and capacities to enhance the delivery of quality public services (Osei-Kyei and Chan, 2017; Boyer and Van Slyke, 2019). Most economies have thus adopted PPPs as neoliberal policy responses and new public management (NPM) practices for promoting greater private sector involvement in public service delivery as government's role and funding reduce (Ginsburg, 2012; Robertson and Verger, 2012; Osei-Kyei and Chan, 2017.). Under neoliberalism, PPPs are presumed to enable governments to transfer some operational roles to efficient private sector operators while focusing better on the core public sector responsibilities, such as regulation and supervision (Miraftab, 2004; Olssen and Peters, 2007; Ginsburg, 2012). Thus, PPPs are viewed as viable collaborative arrangements and policy reforms for reducing government's fiscal and administrative burdens in public infrastructure development and service delivery through increased private sector participation (Cheung et al., 2012; Kim, 2017).

The central philosophy behind PPPs is that all organisations have strengths, but no single organisation has all the strengths required to do everything alone (Rotter and Özbek, 2010). This relates with Reim (2009: 14)'s assertion that "the primary objective of PPP is to deliver a better service than either the public or the private sector could do alone". Thus, PPPs have been adopted as innovative market-led models for improving access to quality public services for the poor and disadvantaged groups cost-effectively through the public and private sectors sharing risks, costs, resources and responsibilities, particularly in capacity and budgetary-constrained economies (Akyeampong, 2009; Yescombe, 2018). In developing countries, PPPs are perceived as a mechanism for attracting and crowding in private investments and expertise for economic development amidst budgetary challenges and pressure on traditional domestic public sources (Amuche and Kukwi, 2013; Ismail and Haris, 2014; UNESCO, 2015). PPPs reinforce efficiency and synergy through sustainable access to private sources of capital and technology for quick social service delivery and the development of supportive infrastructure (World Bank, 2011; Yescombe, 2018).

PPPs in education have grown globally as a market-oriented approach to improving access to quality education for all (EFA) while ensuring equity and social justice (World Bank, 2011; Verger and Moschetti, 2016). Education PPPs (ePPPs) proponents argue that the rising school enrolments and demand for education as a basic need, human right and public good have rapidly outstripped public sector capacity to manage and provide it sufficiently alone (Rose, 2010; Locatelli, 2107; Termes et al., 2020). Thus, ensuring equitable access to quality public sector education amidst government budgetary constraints requires the adoption of ePPP to reduce the role of the state in its delivery (Srivastava, 2010; Kim, 2017). Likewise, by adopting PPPs in universal education, governments hope to efficiently and effectively achieve EFA goals through increased coverage and equitable access (Robertson and Verger, 2012).

Provision of quality EFA is also viewed as the best equaliser in most societies owing to its distributive power through human resource capacity-building (Amuche and Kukwi, 2013; Ben-Shahar, 2015). Education is thus deemed as indispensable for multidimensional transformation, because investing in the human mind makes all other development objectives possible (World Bank, 2011; Mgaiwa and Poncian, 2016). Education is considered a dynamic tool that enhances national capacity-building and people's resilience as they strive towards achieving sustainable development (World Bank, 2011). For the aforementioned reasons, ePPPs have won much popularity and growing support as a mechanism for increasing sustainable access to quality EFA at low cost (UNESCO, 2015; Aslam et al., 2017; Moschetti and Verger, 2020).

Nevertheless, the implementation of ePPPs faces challenges (Mahmood, 2013) and their success depends on some contextualised critical success factors (CSFs) (Mannan, 2014). This study provides a PPP literature review from the global and local perspectives, the methods used in this study and the findings on ePPP in the context of Uganda. It concludes with key lessons learnt and policy recommendations.

LITERATURE REVIEW

Globally, PPPs in education gained momentum in the 1980s as a strategic neoliberal option to address the budgetary constraints and other challenges confronting governments' education service delivery systems (Malik, 2010; Kim, 2017). Hence, most sub-Saharan African governments (like Uganda) have incorporated PPPs into the EFA and universal secondary education (USE) programmes to meet the increasing demand for public secondary school education (Patrinos et al., 2009). Besides, owing to persistent failures and equity concerns in education in most developing countries, where the public sector is a key player in financing and providing public services, ePPPs are seen as appropriate avenues for improving public education delivery (Patrinos et al., 2009). This corroborates Akyeampong (2009)'s study finding in Ghana that ePPPs effectively serve the needs of disadvantaged and hard-to-reach children if resources are provided to support them. Relatedly, studies on ePPPs (LaRocque, 2008; Mahmood, 2013; Baum, 2018) indicate that PPPs can reorient education towards improved access, efficiency, competition and quality in its delivery systems and outcomes. PPPs in USE delivery in Uganda emerged, in 2007 (Chapman et al., 2010), within

such neoliberal educational policy contexts (Patrinos et al., 2009).

While education is viewed globally as a necessary service for enhancing socio-economic development, the resource potential for financing and providing it adequately remains a key challenge, particularly in developing countries (Amuche and Kukwi, 2013; Luthra and Mahajan, 2013). Consequently, some budget-constrained countries have adopted PPPs as a viable policy option for providing and financing affordable quality EFA. Moreover, the World Bank (2011) opines that in developing countries, ePPPs are justified by the demand for access to affordable schooling and the need to tap into private resources where the state cannot afford EFA. Indeed, most ePPP literature emphasises that ePPPs are a means of increasing equitable access to affordable quality EFA on a sustainable basis (Fennell, 2010; Malik, 2010; UNESCO, 2015; Aslam et al., 2017; Moschetti and Verger, 2020).

According to Education International (2009), ePPP models are categorised based on what kind of education service the state procures from the private sector and how it does this. The common forms of PPPs in education service delivery include: private management of public schools; education vouchers/subsidies and scholarships; contracting out the delivery of education services (purchase of educational services from private schools); school infrastructure initiatives; capacity-building initiatives; and education philanthropic initiatives (Latham, 2009; Patrinos et al., 2009; LaRocque, 2011). Though the contracting model seemed common (Termes et al., 2020), another popular model, referred to as build-operate-transfer (BOT), is emerging. *BOT* involves large infrastructure projects, where a private sector operator is granted a franchise (concession) to finance, build and operate an educational facility. The government leases the facility for a specified period, after which it is again transferred to the respective state authority (LaRocque, 2011; Mathonsi, 2013; Robertson and Verger, 2012).

The type of PPP in USE that Uganda adopted in 2007 involved outsourcing education service delivery to private secondary schools as partners (MoES, 2007; Patrinos et al., 2009). This form of ePPP is "the process whereby government procures education-related services of a defined quantity and quality at an agreed price from specific providers" (Patrinos et al., 2009:9). In this policy, the government signed a memorandum of understanding (MOU) with selected private secondary schools to deliver USE services to state-sponsored students for a specific time period (Ministry of Education and Sports [MoES], 2013). The government guides policy and provides finance to procure USE services while the contracted private schools deliver them on behalf of the government to a specific number of enrolled USE students, particularly those from poor rural communities with inadequate access to secondary schools (MoES, 2012). This type of ePPP corroborates Srivastava (2011)'s description of contracting in education as an agreement between a government agency and a private provider to deliver an education service in exchange for regular payment.

This study was motivated by the contextual need to gain insights into the less explored phenomenon of PPP policy in USE delivery whose realities had continued to stir up controversies from a wide spectrum of its stakeholders in Uganda (MoES Report on USE National Headcount Exercise, 2014). Besides, while there is a diversity of international and local scholarship on ePPPs (Akyeampong, 2009; Rose, 2010; Srivastava, 2010; Robertson and Verger, 2012; Kasenene, 2013; Mathonsi, 2013; Barungi et al., 2015), it hardly explores how and why stakeholders understand PPP in USE in the way they do, and what they perceive as its CSFs. Yet, for the PPP policy to achieve its objectives and be sustainable, identifying its CSFs is crucial (Mannan, 2014; Rashed et al., 2017). Likewise, because PPP risks and challenges are diverse, identifying context-specific CSFs has been widely recognised as a best practice for the successful implementation of PPPs (Zhang, 2005; Forrer et al., 2010).

Conceptually, CSFs are absolutely necessary for an organisation or project to achieve its objectives (Rockart, 1982; Chan et al., 2010). In this connection, a number of CSF studies (Zhang, 2005; Chan et al., 2010; Abeer et al., 2011; Babatunde et al., 2012; Cheung et al., 2012; Ismail, 2013; Emmanuel, 2016; Osei-Kyei et al., 2017; Fang and He, 2019) have generally pointed out the following as CSFs for the successful implementation of various PPP projects globally: trust; openness; fairness; mutual respect; appropriate risk allocation and sharing; a competitive and transparent procurement process; commitment by the public and private sectors; a favourable legal framework; accountability by partners; government provision of guarantee and political support; stable macroeconomic conditions; and the availability of suitable financial markets.

Though the extant literature on CSFs is abundant, there is limited scholarship on CSFs for ePPPs, particularly on USE delivery in Africa and from the perspective of stakeholders' lived experiences and understandings. Yet such CSFs are relevant both for the effective implementation and management of PPPs in resource-constrained developing countries where PPPs are still new and are performing relatively poorly in public service delivery and for effecting reforms as policy contexts evolve with time (Cheng et al., 2012). Interestingly, empirical studies on CSFs in the extant literature predominantly hinge on non-educational PPP projects in energy, housing, water supply and road infrastructure (UNECE, 2008; Osei-Kyei and Chan, 2017; Adamu, 2019; Chileshe et al., 2020). Furthermore, a critical review of the different PPP studies reveals that while some CSFs seem to be context-specific and differ across sectors, projects and countries, a few others

appear to be universally applicable to PPPs (Cheung et al., 2012; Mannan, 2014; Fang and He, 2019). In this vein, Patrinos et al. (2009) suggest that more research is necessary on the linkages between PPPs and education outcomes owing to different country-specific settings.

Methodologically, phenomenological interpretive studies on the PPP debate are inadequate to enable in-depth understanding of this policy phenomenon. Chan et al. (2010) echo this when they point out the need for more in-depth case studies to verify the reliability of the CSFs identified for PPPs in other contexts. Besides, Pakistan Action Aid (2010) reveals that rigorous research on the PPPs is lacking, and that most of the existing evaluation data is generated by the PPP programme owners themselves, who may have conflicting interests. In this regard, some scholars (Patrinos et al., 2009; Ismail, 2013; Jomo et al., 2016) have suggested that there is need for more research and understanding of CSFs for PPPs since the countries in which they are implemented are contextually different.

The foregoing PPP literature indicates that studies on CSFs for PPPs in education based on stakeholders' understandings and perspectives, particularly relating to USE delivery, are missing in this policy debate. Therefore, such contextual, methodological and knowledge deficiencies in ePPP literature justified conducting this study in Uganda, where PPPs are still new and controversial. The following research questions were designed to guide this study: How do stakeholders understand the implementation of PPP policy in USE delivery in Uganda? What do stakeholders perceive as CSFs for implementing PPP in USE in Uganda?

MATERIALS AND METHODS

Research design

This study was conceptualized within phenomenology as its philosophical stance, and it employed exploratory qualitative case study approaches through an interpretive paradigm for in-depth understanding of this policy and its CSFs from stakeholders' subjective viewpoints (Crotty, 1998; Yin, 2009; Grix, 2010; Maree, 2012). Moreover, Yuen (2005) argues from the interpretive perspective that understanding is a precondition for correct interpretation and sense-making of the [policy] phenomenon experienced.

Study population and sampling procedures

Wakiso District, in Uganda's central region was considered as a case study area owing to its dominance in having more partnership schools in rural-urban settings than other districts (MoESTS Statistical Abstract, 2014). The study was informed by Freeman (1984)'s stakeholder theory as its appropriate theoretical lens. The 28 stakeholders for the study, who were purposively selected, included four Ministry of Education (MoES) officials, four district local government workers, two members of Parliament, two school proprietors, four head teachers, four teachers, two parents, two local leaders, two NGO-based educators and two academics with experience and knowledge of PPP policy in USE. Stratified purposive sampling was employed to ensure that an adequate sample of information-rich participants was selected from each specific group of government-based and school-based stakeholders. Snowball sampling also emerged naturally in this study owing to the instances in which some interviewees would refer to other information-rich cases. The sample size was also partly determined by data saturation (Onwuegbuzie and Leech, 2007). Using maximum variation sampling (Christensen et al., 2015), four private secondary schools were purposively selected based on their size and distribution of USE-sponsored students, performance, and location in relation to urban or semi-urban and rural settings.

Data collection and analysis procedures

Qualitative data collection and analysis procedures were employed in this study. Data collection was conducted in 2016 and 2017 through in-depth interviews, document analysis and field notes. Triangulation of data sources and methods, among other trustworthiness measures, was adopted to ensure the quality, validity and credibility of data and research findings (Miles and Huberman, 1994; Maree, 2012; Creswell, 2014). To maintain study participants' confidentiality and anonymity, pseudonyms were employed to represent their responses in the entire study process. The interviews with selected stakeholders were audio-recorded with their voluntary consent. They were transcribed and analysed using content and thematic approaches (Rubin and Rubin, 2011; Saldaña, 2015).The interview data was then corroborated with information drawn from relevant PPP policy documents. The documents reviewed included the MoES (2012) National headcount report on USE, the MoES (2013) PPP policy guidelines for implementing USE in Uganda, the MoESTS (2014) Statistical Abstracts, the Uganda PPP Policy Act (2015), and various journal articles and international publications on PPPs and CSFs. Analysis focused on stakeholders' understanding of PPP policy in USE and their perceptions of its CSFs in Uganda.

RESULTS AND DISCUSSION

Stakeholders' understanding of the policy

This section presents the findings on stakeholders' understanding of the implementation of the PPP policy in USE in Uganda. It focuses on how and why stakeholders made sense of the policy origin, purpose, guidelines and success in USE delivery. It identifies the similarities and differences in the ways stakeholders understand this policy and why. For ease of cross-case comparative analysis of their understandings and perceptions of the policy realities, the stakeholders were mainly categorised into government-based stakeholders (MoES and district local government officials) and school-based stakeholders (school proprietors, head teachers, teachers, local community leaders and parents). The analysis was guided by the research questions: How do stakeholders understand the implementation of PPP policy in USE delivery in Uganda? The literature on policy implementation emphasises the construct of understanding (Singh et al., 2014), without which the success of the policy is suppressed. This is consistent with Martinez et al. (2014)'s advocacy for sensitizing all

stakeholders to the nature of PPPs, why they are needed and their possibilities and limitations in order to mitigate misunderstandings and inherent biases, which commonly cause information asymmetry and introduce barriers in their implementation. This confirms that stakeholders' understanding is an inevitable tool for successfully doing policy (Maguire et al., 2012).

Understanding of the origin of the policy

Most stakeholders perceived the origin of PPP policy in USE from the perspective of the government's need to increase access to affordable USE, the problem of excess demand caused by the influx of learners into USE amidst insufficient capacity in public secondary schools, and budgetary constraints. These understandings are presented under the following emerging sub-themes.

Increasing access to affordable USE

Under this sub-theme, the findings indicate that most stakeholders expressed their understanding of the PPP policy in USE as having emerged from the government's objective of increasing access to affordable USE for all children. In this regard, an inspector of schools viewed this policy as an alternative government strategy to increase access to EFA. She explained:

… The major goal of this policy was really ensuring USE access for all; and since access for all could not be achieved in the government-aided schools, then the private schools were a second window through which increased access could be achieved. (Interviewee SH11)

Likewise, one parents' representative from partnership school B perceived the policy to have arisen from the government's need to achieve equitable access to USE. He stressed:

About that policy, my understanding is that it was purposely meant to give equal opportunity to all the children, both the rich and the poor… So with the introduction of this policy…many of the children from poor families are also able to access secondary education… (Interviewee SH21)

The above excerpts reveal that both government and school-based stakeholders share the understanding that the PPP policy originated from the government's need to increase equitable access to affordable USE for all. This is consistent with the extant literature (LaRocque, 2009; Patrinos et al., 2009; Srivastava, 2010; Verger, 2011; MoES, 2013, 2014; Mahmood, 2013; Mgaiwa and Poncian, 2016), which points out that ePPPs mainly arose from the need to expand access to quality public education for the growing numbers of children, mainly from poor and underserved households in developing economies.

The excess demand for USE amidst inadequate capacity of public schools

Furthermore, other stakeholders perceived the ePPP policy to have resulted from the increase in the demand for USE caused by the large influx of learners, yet the available public secondary schools had inadequate capacity to provide it alone. A policymaker in the Ministry of Education corroborated this. She remarked:

…the government schools which were available could not handle the influx of the children who were joining secondary schools at that level. So, it was considered pertinent to involve other stakeholders who would be willing to work with government. So, it's against that background that the PPP aspect came in… So, that's how the policy started. (Interviewee SH11)

This understanding was echoed by a commissioner in the same ministry, who said:

…PPP policy was introduced in year 2007…when government took on USE…we didn't have enough capacity to cater for all the students that were qualifying for this [USE] programme. So, it was fit to call upon the private sector [secondary] schools to come and render a hand, which they did willingly…(Interviewee SH7)

The preceding extracts indicate that most stakeholders perceived the introduction of PPP in USE as a policy response to the excess demand for USE by an influx of learners amidst the inadequacy and capacity limitations of government-aided secondary schools. This evidence is consistent with some scholarship (LaRocque, 2009; Mahmood, 2013), which affirms that PPPs in education resulted from excess demand for affordable public education services outstripping the capacity of public sector schools to satisfy it alone. This corroborates the central philosophy of PPPs that all organisations have strengths, but no organisation has all the strengths required to do everything alone (Reim, 2009; Rotter and Ozbek, 2010). Moreover, Patrinos et al. (2009) argue that, where the demand for education exceeds its supply owing to limited capacity and limited public funds, ePPPs become a suitable and cheaper policy intervention.

Budgetary constraints as the driver of PPP in USE delivery

Some stakeholders also perceived this policy as having resulted from the public budgetary constraints which the

government experienced in USE delivery. One district administrator viewed this PPP policy as a strategic way of bridging the gaps caused by public resource constraints in education service delivery. He elaborated:

… Resources across the globe have never been enough, and the government cannot do what it's supposed to do singlehandedly in education… But because of the public resource constraints, some other private organisations can come in to bridge this gap. So, government sought help from the private practitioners [PPP schools] in bridging this gap in education… (Interviewee SH12)

Similarly, one academic noted that PPP in USE emerged as a private sector-led policy tool to stimulate investments in private education for problem solving in USE delivery:

… Uganda is largely pursuing a private sector-led economy….So, in order to stimulate investment into the education sector, this PPP comes in as a vehicle to help government achieve its goal of having a private sector-led economy; which in turn would also lead into solving partially education service delivery challenges… (Interviewee SH22)

The aforementioned stakeholders' perspectives seem to suggest that the PPP policy in USE arose from public resource constraints in USE delivery. This finding is consistent with that of Reeves (2013), who identifies fiscal resource pressures as the major trigger for the adoption of PPPs in the country's public sector service delivery engagements. This concurs with Patrinos et al. (2009)'s and the World Bank (2011)'s assertions that the scarcity of resources for public services delivery is the key justification for the adoption of PPPs in most developing countries.

Stakeholders' understanding of PPP policy guidelines

This sub-theme provides stakeholders' understandings of the implementation of PPP policy guidelines in USE (MoES, 2013). This study uncovered varied understandings of the policy guidelines among stakeholders and the existence of stakeholders who implemented a policy they did not clearly understand, which was mainly attributed to an imbalance in policy information access. For instance, when asked about her understanding of the policy guidelines, one teacher from partnership school C expressed lack of awareness of the guidelines for the policy she implemented. She attributed her lack of awareness to not being alerted to the existence of the guidelines. She remarked:

…I am not aware of those policy guidelines… I really don't want to deceive you, I really don't know. To be sincere…I cannot tell you as we are not informed about the policy. … I don't think [that] all the people are informed about it, …a few who are within the Ministry of Education maybe, but others do not…because we have not had any people coming around at least to sensitise us about partnership that the government is having with these other stakeholders. (Interviewee SH2)

Expressing a similar sentiment, one local community leader noted that "we would be able to know [understand] the policy if we were greatly involved in its implementation…but they didn't inform us about it..." This confirms lack of a clear understanding of the policy guidelines by most school-based stakeholders, because they were neither informed and sensitised regarding the policy nor engaged in its implementation. This finding corroborates Higham and Yeoman (2009)'s affirmation that the degree of stakeholders' engagement in the partnership policy has a great influence on their understanding of it. On the contrary, most government-based stakeholders seemed to have a clear understanding of the PPP policy guidelines for USE delivery. In this regard, one local government official provided his insights into the policy process as follows:

…these PPP schools were selected basing on application…and the criterion was a competitive one basing on a number of issues; say infrastructure development. Do you have the classrooms at your school? Do you have qualified teachers? How spacious is your school? Do you follow the curriculum of USE education? …the head teachers, and other stakeholders like [school] board of governors of these various schools were inducted and oriented about the aims of this policy; and they entered into the memorandum of understanding well knowing what tasks were ahead of them and what were expected out of them. (Interviewee SH12)

Another government stakeholder echoed:

…Of course there were certain considerations that were made and one of them was that the school should be registered by the Ministry of Education and Sports; you should have reputable people in charge of these institutions… who could take forward this policy agenda. And we also considered schools that were charging 47,000 Uganda shillings [$11USD] and below per term, and that there was no any other government [aided] secondary school in that area. So, thereafter, a partnership agreement was written out with guideline, and of course we have the basic requirements and minimum standards which these schools must conform to. So briefly that's how the policy guidelines of partnership were. (Interviewee SH4)

The above responses indicate that most government

stakeholders exhibit clear and high levels of understanding the policy guidelines (as contained in MoES, 2013; PPP Policy Act for Republic of Uganda, 2015) compared to school-based stakeholders owing to their technical roles, work experience and great involvement in the entire policy implementation process. Yet most school-based stakeholders, who were neither informed nor sensitised regarding the policy guidelines, implemented a policy which they did not clearly understand. This finding seems to suggest that in certain contexts, some public policies may be implemented by stakeholders without having adequate policy information and a clear understanding of the policy guidelines. This finding partly bears out those of Martinez et al. (2014), who explored similar cases of stakeholders' misunderstandings and misperceptions of the PPPs in infrastructure in the USA. Such a context-specific anomaly therefore contradicts Maguire et al. (2012)'s assertion that the critical factor in policy implementation is sense-making (understanding) by policy actors through effective communication. This revelation seems to suggest that variations in stakeholders' understanding of the PPP policy in USE were mainly informed and influenced by the differences in the contexts in which they implemented it (Blignaut, 2008; Palmer and Rangel, 2011).

Stakeholders' understanding of the PPP policy success in USE delivery

In this study, stakeholders perceived policy success based on the extent to which its objectives (MoES, 2013) of increasing access, quality and equity in USE delivery were achieved. Though most stakeholders shared the understanding that the PPP policy had partly succeeded in increasing access to USE through improved student enrolment, they disagreed and varied in their understanding of overall policy success with regard to issues of equity and quality in USE delivery. In this study, while most school-based stakeholders perceived the policy as unsuccessful (owing to the undermined equity and compromised quality of USE outcomes in most PPP schools), the majority of government-based stakeholders perceived it as successful because of increased student enrolment and access to USE. In the light of this, one government stakeholder said that "…the policy has been a success story because at least it has been able to bring more children on board to access secondary education and fill up gaps where government was not able to do…" Another government official noted that despite the existence of some gaps in the quality of USE, the policy was partly successful because of its unintended positive consequences for learners through increased access to USE. She elaborated:

…in terms of access, there is a big achievement. The number of children who have accessed secondary education since the beginning of USE in the community has been a great success. …these children having the four years at school, even if they don't excel, but they definitely have grown physically and mentally, and they've been exposed more. So they are more civilised citizens than those who didn't have that chance. But in terms of the quality of results, we still have a big gap. (Interview SH11)

In the same vein, another government stakeholder conceded that though access to USE improved, its quality had been compromised through the teaching and learning processes. He noted:

…while access has increased, quality of education has not really improved that much. … So it is an indication that quality is somehow compromised in terms of quality of teaching and learning…but we are saying that while access has been achieved largely, equity is not clearly achieved because quality is not across the board. Quality is an issue that we are grappling with as a Ministry… (Interviewee SH7)

In spite of the compromised quality of USE outcomes, most government-based stakeholders perceived the policy as successful owing to its positive impacts, including increased access to USE, reduced number of teenage pregnancies, a decline in dropout rates and absenteeism, attitude change, improved civilisation/exposure, skills development and acquisition, and the mental growth of learners. These findings are consistent with MoESTS (2014) and Gibson and Davies (2008)' argument that ePPPs not only impact positively on access to and quality of education but also on school enrollment, class attendance and attitude and behavioural change among students. Nevertheless, most school-based stakeholders and academics perceived the policy as unsuccessful owing to its failure to ensure equity and quality in USE delivery. In this regard, one school-based stakeholder pointed out that the policy was not successful as it did not meet its expectations. She emphatically said:

No; and a strong NO! The policy has not created any great impact as we expected. We would expect a private partnership school to have improved in everything: its academic standards, its infrastructural development, and its retention of staff and even students but it is not the case. (Interviewee 16)

In a similar vein, one academic perceived the policy as unsuccessful because both learner performance and the quality of USE or teaching received in PPP schools was lower than in non-PPP schools. He observed:

This policy promoted access which is a good thing but exacerbated inequity and quality among learners… when

you compare what is happening in [partnership] private schools to other better USE schools, they are not getting the same quality education. So, PPP in USE is exacerbating the situation between the rich and poor, between the urban and rural… We know that equity has not been achieved and access is still limited, because most of the PPP schools are not in hard-to-reach areas… (Interviewee SH10)

The preceding insights indicate that most school-based stakeholders and academics judged the policy as unsuccessful mainly because of equity concerns and the low quality of USE delivered in most PPP schools. They perceived policy success based on the extent to which its goals of access, quality and equity were all achieved. Besides the compromised teaching-learning process, most stakeholders attributed the low quality of USE to inadequate capacity and resources as well as lack of regular school supervision of PPP schools. For instance, one stakeholder noted "…the quality of USE has been compromised by lack of constant and regular supervision mainly by government, yet every district has an inspector of schools". In this study, most non-state actors considered the success of the ePPP policy in connection with its USE quality and equity outcomes (Verger et al., 2020). Moreover, USAID (2008) points out that many countries have now shifted their focus away from the objective of access to that of quality in education. Likewise, Kaboru (2012:247) opines that "increased coverage [access] is highly desirable but insufficient unless it is accompanied by an improvement in the quality of public services". This understanding of policy success is consistent with Hodge and Greve (2011:11)'s assertion that the "PPP policy is deemed successful if its objectives are met and desired outputs are achieved". Based on their understandings of the policy realities, stakeholders suggested the following key success factors for its implementation.

Stakeholders' perceptions of the CSFs for PPP policy in USE

This section provides what stakeholders perceived as necessary factors for the success of PPP in USE delivery. It sought responses to the research question: What do stakeholders perceive as CSFs for the implementation of the PPP policy in USE in Uganda? These factors emerged from stakeholders' lived experiences, understanding and perceptions of this policy. The stakeholders' key insights into CSFs were categorised and discussed under the following emerging sub-themes.

Selecting suitable partners with adequate capacity

In this study, the findings reveal that most selected PPP schools experienced understaffing and resource inadequacies. Most stakeholders consequently suggested the selection of suitable partnership private schools with adequate capacity in terms of quality facilities, quality teachers and monetary resources to provide quality USE outcomes and better school management. In view of this, one government stakeholder commented:

…we [government] should select schools with good human resource, including both support teachers and management…even when they operated under challenges for some time; but if there is good management and there is right numbers of well qualified and supported teachers, this [policy] will be sustained. …and on top of that the environment should be conducive [with] the equipment and facilities especially for science subjects, the labs should be okay, they should have the libraries…(Local Government official 6)

The above response indicates that the government should select private schools with adequate quality staff, a well-facilitated school environment and good management in order to effectively deliver USE through the PPP policy. This finding is consistent with Patrinos et al. (2009)'s assertion that the capacity of a contracting agency/partner is paramount for the successful implementation of ePPPs. Moreover, Mgaiwa and Poncian (2016) argue that adequate quality of teaching staff is a key determinant of quality education and its outcomes through ePPPs. This finding on the selection of PPP partners with adequate capacity is consistent with those of most non-education PPP studies (Chan et al., 2010; Abeer et al., 2011; Cheung et al., 2012; Ismail, 2013; Osei-Kyei et al., 2017) in which it is considered as a KSF for PPP projects.

However, one stakeholder revealed that the selection of partnership schools was not fully based on the principle of adequate capacity owing to the political influence and the urgency with which the policy was incorporated into the USE agenda in Uganda. He elaborated:

Some of these PPP schools really have come on board because of politics. …sometimes there was so much pressure that we were forced to have PPP schools…. where we didn't even require to have it. You have a PPP school which does not even have enough facilities, but because you know somebody with [political] power has already requested and there is pressure, you have to go ahead and say okay [approve it]… (MoES official 4)

This finding supports Srivastava (2010)'s assertion that political influence is a factor in the choice of PPPs and partners despite their inability to provide quality services. This undue political influence in the selection of PPP partners can be regulated by establishing strong autonomous PPP units or structures.

Regular monitoring and supervision of PPP implementation

Having experienced lack of follow-up on partnership schools by the government as regulator of the PPP policy, most stakeholders suggested the need for regular monitoring and supervision of its implementation by enhancing the existing capacity and functional structures. In this regard, one government-based stakeholder suggested:

There is need for strengthening the supervisory function, because the department responsible for that doesn't have the whole capacity to go to these schools regularly as possible… So, the supervisory function should be improved from the local community level structures. (MoES-Government official 1)

Likewise, some school-based stakeholders suggested the establishment of a routine policy monitoring and evaluation mechanism to ensure stakeholders' adherence to its terms and conditions:

… The government should provide a mechanism for monitoring and supervising the policy to ensure that the schools adhere to contents of the partnership agreement between them and the government…The other issue that government needs to ensure is routine monitoring of the programme in all schools wherever they are so that there is no diversion of resources... (School head teacher)

The above findings, which suggest participatory regular monitoring and supervision of PPP implementation activities through local community structures, agree with the PPP scholarship (Latham, 2009; Hodge and Greve, 2011; Aslam et al., 2017). This acknowledges the need to strengthen the monitoring and regulatory capacity of government mechanisms while instituting indicators and quality assurance standards against which PPP partners and policy success are monitored and evaluated for compliance purposes. Similarly, the preceding findings and PPP literature (Jamali, 2004; Mahmood, 2013; Verger and Moschetti, 2016) posit that the government should set clear standards and build adequate capacity and mechanisms to ensure regular monitoring of ePPP policy to ensure its success.

Transparent regulatory and accountability enforcement mechanisms

This study established that the PPP funds were misappropriated and abused by some stakeholders owing to lack of transparent accountability structures, yet they continued receiving the funds. Based on such adverse lived experiences, most concerned stakeholders proposed that a transparent accountability framework be established to ensure timely disbursement and effective use of and accountability for PPP funds. In this respect, one school-based stakeholder suggested:

… All those recipients of PPP funds, whether its government money or donor money, they should account for it promptly… We should make it more transparent because …people think that the headmaster gets a lot of money. Transparency should be ensured in the Ministry and to us the recipients and parents…so that we get to know exactly what amount of money was received… (School proprietor and head teacher)

Another school-based stakeholder added:

…the government should have a stronger focus on accountability and school inspection, because that would help improve school standards. …the only thing that we need to do I think in the contract is do the student headcount … We do lots of internal audits every year for each school, but there are also externally audited as well. So for us, we have our own internal mechanisms for accountability because we want to do over and above the government requirements. So, if government has good partners with good accountability structures, there will be stronger accountability. So, if the partners are good and transparent, they should be given more funding; but if then they are failing to deliver on student learning outcomes, and then it should be taken away from them… (NGO-based educator)

The above findings suggest that government should enhance the enforcement of accountability measures and internal controls in partnership schools to ensure ePPP policy success. These findings are consistent with the opinions of other PPP proponents (Forrer et al., 2010; Srivastava, 2010; Brinkerhoff and Brinkerhoff, 2011; Heald and Georgiou, 2011) on the need for transparent accountability mechanisms with clearly defined procedures against which PPP partners can be evaluated and held accountable. This proposal also corroborates the views expressed by UNICEF (2011) and UNESCO (2017) that if all stakeholders were held accountable for their roles and actions, ePPPs would improve the efficiency and quality of education service delivery. Besides, an NGO-based educator suggested the tagging of PPP funding to compliance and performance levels to enhance accountability by partnership schools in Uganda (Mahmood, 2013).

Stakeholders' commitment to partnership roles

The findings of this study reveal that unless stakeholders in the PPP policy in USE are committed to their partnership roles, its implementation will continue to be a challenge. In this regard, one concerned government

stakeholder pointed out that this commitment is a critical factor for successful policy implementation. He stressed:

We should get to know that this education policy is a collective responsibility… each and every stakeholder should do his or her roles. Government must increase funding, parents must provide scholastic materials for their children…and there should be timely release of funds, of course by the central government; and even the schools must account for the money on time and they must stop wasteful expenditures. ...each and every stakeholder should walk the talk, and do what is expected… and we try to behave as professionals … (Local Government official 6)

Another school-based stakeholder emphasised that stakeholders' commitment and devotion to their roles are the most important success factor for this policy. He noted:

Commitment summarises everything else in partnerships. If the government is committed to release money in time and if we who are on the lower level are also committed, we can all do what we are supposed to do as clarified. The issue is commitment, dedication and knowing that we are doing this as a service to the country not to ourselves or to anybody else… (PPP school head teacher)

The two preceding extracts suggest that all stakeholders in this policy should be committed to their respective roles with professional integrity. This is consistent with Ismail (2013)'s work which perceives commitment and responsibility as fundamental principles in PPPs to which all stakeholders should adhere in the interests of all. This policy recommendation was also in line with Freeman (1984)'s stakeholder principles of corporate legitimacy and agency, which stress that each party must fulfil its roles to serve the interests of all stakeholders for the benefit of all. Thus, the success of ePPPs is sustainable where partners are committed to performing their respective roles.

Regular policy review

It also became evident in this study that the contexts in which stakeholders implemented the PPP policy in USE had evolved over time. Yet the terms and conditions, as stipulated in the PPP policy guidelines, had remained relatively fixed, restrictive and partly irrelevant since 2007. For instance, the policy terms forbade partnership schools from imposing any extra cost beyond the fixed PPP subsidy (equivalent to US$12 per child per term) that they received from the government, yet its value had drastically fallen. Such a mismatch caused most stakeholders to advocate regular ePPP policy review to make the policy flexible and compatible with the evolving contexts. In this regard, one school-based stakeholder suggested:

We need to amend the policy to match it with the current trends. The policy was adopted in 2000s, but over that period of time things are changing. …For me the most critical aspect is that we need to amend the programme [policy] to incorporate more of the views of the stakeholders at a school level so that it becomes publicly acceptable by people who are implementing it… (School head teacher)

This view corroborates one government official's remarks that "…the policy has remained static and yet the circumstances have kind of evolved; so, the policy needs to be fluid and continually be revised, which has not happened." Another government official reiterated:

We need to review the policy guidelines and make them much more binding and comprehensive by introducing aspects of quality. Because the guidelines are just broad, they are looking at mainly inputs but we are not tagging this partnership policy to the outcomes. So, the guidelines should have also come up with clear targets. [If] there are no targets; how do you hold these schools accountable? (MoES official 4)

The aforesaid policy narratives and recommendations conform to Forrer et al.'s (2010) perception that regular policy review is crucial to successful policy implementation. This makes the policy and its guidelines clearer, simpler, flexible and more binding for compatibility within the evolving policy environment. This finding concurs with Mgaiwa and Poncian (2016)'s assertion that education policy review is a corrective measure for the successful implementation of education PPPs. A flexible ePPP policy creates a better fit between supply and demand for education services; otherwise, private actors would be pushed to illegitimately operate outside its set guidelines (Latham, 2009).

Timely provision of sufficient funding

Most stakeholders unanimously suggested that timely provision of sufficient funding to the PPP schools is a CSF for the effective implementation of the PPP policy in USE. In this regard, one school-based stakeholder proposed that the government should both increase the PPP subsidy and consider taking up the payment of teachers' salaries in partnership schools. He commented:

I think government should increase funding to these schools. And then, apart from the funding they give per child, government should look at the tradeoff in terms of teachers' recruitment; they could probably not give the

money directly to the school but they could be paying teachers in PPP schools…because these private schools, particularly in the villages, find it difficult to recruit science teachers … (PPP school teacher)

One parent echoed:

I think government should increase the funding… that money which schools receive is little…if the government could as a partnership take up some teachers' pay and be incorporated in the government salary scheme; I think that would help these PPP schools in delivery of quality USE. (Parents' representative)

The preceding findings suggest the need for adequate funding to PPP schools and improved pay for teachers for quality USE service delivery. These findings support Brinkerhoff and Brinkerhoff (2011)'s argument that, to ensure quality public services through PPP, the governments of poor countries should retain the responsibility of financing the private partners. Education systems with high public funding levels have better performance outcomes (Verger, 2011).These viewpoints echo Srivastava (2011)'s argument that additional funding for ePPPs is necessary for improved quality of schooling, mainly in poorer communities with a large influx of learners. Srivastava's argument supports one stakeholder's view that "…you cannot have good quality of education without funding." This implies that quality of education is a direct function of funding. Thus, the quality of USE is a monetary issue, because the success of the PPP policy in its delivery will greatly depend on adequate funding to the better managed PPP schools.

Regular policy communication and sensitisation of stakeholders

Finally, this study reveals that while some stakeholders clearly understood the PPP policy in USE that they implemented, others did not. Some stakeholders attributed the variations in understanding the policy to lack of sensitisation and regular communication on policy, limited access to policy information and language barrier in policy communication. Therefore, most stakeholders suggested that stakeholders' awareness of the policy be enhanced through regular sensitisation and policy communication using appropriate channels and forums. In this regard, one stakeholder said:

I think we need to put some extra effort in terms of sensitising the masses but specifically in making them understand their roles in the whole programme, because every stakeholder has to know his/her role…to make this programme successful. (School head teacher)

Another stakeholder added: "But I think we need to have a platform in which government can always constantly have these ideas from the PPP schools".
Yet another stakeholder observed that the way the policy is packaged for communication is crucial to its success. He remarked that:

…packaging of the policy message clearly is what matters first. The communication passing from the Ministry needs to really be clear and brief and concise to show out what government expectations are for the community and also what documentation they expect from the government. (Academic and member of policy think tank)

The above stakeholders' perceptions suggest the need to enhance stakeholders' awareness of the PPP policy through mass sensitisation, regular communication and dialogue. As OECD (2012) affirms, the stakeholders emphasize that the simplicity and clarity of policy communication packages are the best principle for PPP success. These findings agree with extant scholarship (Reim, 2009; Hodge and Greve, 2011; Reeves, 2013) on non-ePPPs, which emphasise regularity, consistency and clarity in communication through appropriate strategies and channels. Thus, to reduce policy information asymmetry, stakeholders should regularly communicate effectively to one another through appropriate policy packages and channels for PPP success. This is because sensitisation, communication and feedback ensure clarity regarding PPP policy, which enhances mutual trust and commitment among partners in its implementation.

Policy lessons and recommendations

The following key lessons learnt and recommendations are intended as practical future policy considerations for PPP stakeholders:

(i) An effective policy communication structure should be established to promote stakeholders' awareness of the policy and reduce information asymmetry.
(ii) The government should legitimately select committed partnership schools with adequate capacity to deliver quality USE services.
(iii) Sufficient funding should be disbursed punctually to better managed partnership schools.
(iv) Transparent accountability mechanisms should be established against which PPP partners should be evaluated and held accountable.
(v) An enforcement and regulatory body (PPP unit) with adequate capacity and autonomy should be established to monitor and evaluate ePPPs regularly.
(vi) Performance standards and targets must be incorporated into the ePPP policy for quality assurance in USE delivery.

(vii) The PPP in USE should be regularly reviewed for compatibility and flexibility within the evolving policy environment.
(viii) The PPP policy in USE should not be seen as a 'one-size-fits-all policy' owing to the different contexts in which partnership schools operate.

Conclusion

This study has contributed to understanding stakeholders' perceptions of the PPP realities and its CSFs in USE delivery in the Ugandan context. It has established that the PPP policy contexts which stakeholders experience seem to influence their perceptions and understandings of it. The study reveals that some stakeholders can implement the policy without clearly understanding its details owing to the context-specific differences in which they implement it. Besides, this phenomenological interpretive oriented study has made a methodological contribution to narrative policy analysis research in the field of PPPs. It has revealed that the success of the ePPP policy depends, as its CSFs, on stakeholders' commitment to their roles, regular policy review, sufficient funding, selecting partners with adequate capacity, regular policy monitoring and supervision, transparent accountability mechanisms, regular policy communication and sensitisation of stakeholders. Besides, it has confirmed that certain CSFs for ePPPs and for non-education PPPs are similar possibly owing to some similarities in the nature/type of contracts, implementation experiences, challenges and contexts. These findings will inform appropriate policy reforms and best practices for the successful implementation of ePPPs in Uganda and other similar contexts worldwide. This study contributes enormously to understanding the country- and context-specific CSFs of ePPPs that may facilitate engagement in further policy debates on what PPPs may entail in other global contexts. Finally, further research should be conducted to explore ePPP opportunities for ensuring social distancing and resilience in equitable access to quality EFA in the Covid-19 era.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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Structural modification challenges facing the implementation of inclusive education policy in public secondary schools in Tharaka-Nithi County

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Educational policy guidelines mandate that all learning institutions, adopt, design and embrace programs that are conducive to learners with disabilities. In spite of inclusive education policy guidelines, disability remains a major course of discrimination in Kenyan schools. This study therefore, examined the structural modification challenges on the implementation of inclusive education policy in schools. The study adopted mixed-method research approach, which uses both qualitative and quantitative methods. The target population comprised all the principals, teachers and students in Tharaka-Nithi County. The study employed purposive sampling to select 16 extra-county and county secondary schools. The sample size constituted 161 respondents. The data were collected using questionnaires for 100 class teachers, teaching learners with disabilities, an interview guide for 11 learners with physical disabilities to discuss their personal experiences on structural modification challenges and focus groups discussions for 50 non-disabled students learning in the same classrooms with learners with disabilities. Quantitative data were analyzed by descriptive statistics of frequency counts and percentages while qualitative data were analyzed thematically. The research findings established lack of modified physical resources, poor attitude towards inclusive education policy, poverty among parents of children with disabilities, and lack of teachers' skills on Special Needs Education (SNE) were major challenges facing the implementation of inclusive education in public secondary schools. There are other structural modification challenges not in the scope of this study that could be affecting implementation of inclusive education policy and can be tackled at school level. The study established a clear link between structural modification challenges and weak policy guidelines. Therefore, the study concluded that weak inclusive education policy guidelines on structural modification in schools led to lack of modified physical resources, poor attitudes of key stakeholders, poverty and lack of teachers' skills on SNE, which contributed to poor implementation of inclusive education. Thus, a clear inclusive education policy guideline on structural modification is necessary to enable schools provide a learner-friendly environment, that nurtures learner diversity.

Key words: Structural modification challenges, inclusive education policy, public schools, Kenya.

INTRODUCTION

Structural modification can be defined as any intervention within a school whose primary purpose is to improve an individual learner's functioning and independence, thus nurturing access and participation for learners living with disabilities. The purpose of structural readjustment under inclusive education policy is to give every learner equal access and participation, which is their fundamental right to education, and this is recognized as a human right, (United Nations Educational, Scientific and Cultural Organization (UNESCO), 1994; United Nations Conventional on the Rights of Persons with Disabilities (UN-CRPD), 2006). Inclusive education policy requires schools to provide special education services such as an establishment of a safe and a barrier free environment, learner-friendly buildings, modified furniture and equipment for learners with special needs and disabilities (RoK, 2009, 2012). Successful implementation of an inclusive education policy advocates the creation of awareness in schools, so as to understand their own prevailing challenges, assets and resources necessary for transformation. This consequently leads to the understanding of the education frameworks that facilitate school evaluation on inclusion, supportive partners and collaborators, and developmental strategy for an inclusive, school-wide readjustment (Schuelka, 2018; Swift Center, 2018; UNESCO-IBE, 2016). Structural modification should therefore focus on school assets and resources to enable them create a conducive and friendly environment for all learners. This study also advocates for the incorporation of the negative challenges brought about by novel Corona Virus (Covid-19) pandemic on learners with disabilities, in designing and in the implementation of inclusive education policy especially in developing countries (RoK, 2020).

The effort on an all-encompassing education for learners with disabilities was enhanced with the adoption of the Salamanca Statement and Framework of Action on Special Needs Education in Spain (UNESCO, 1994). The Salamanca Statement was developed from the Education for All (EFA) crusade advocating for universal access and participation to a basic education. With its 117 signatories, inclusive education became obligatory for signatory countries. The governments were mandated to give priority to their policy, legal and budgetary provision to reorganize the education system for the provision of quality education for all and to promote learners' diversity in acquisition of quality education (UNESCO, 2015). Despite this directive call to inclusion, there has been confusion in practice due to lack of authority in the definition of an inclusive education (The United Nations Children's Emergency Fund, 2016; Global Partnership for Education, 2018). Consequently, the Conventional on the Rights of Persons with Disabilities (CRPD) was published and endorsed by 177 signatory countries (United Nations, 2006). The CRPD intended to safeguard the right and pride of persons with disabilities and to treat them as persons with equal rights in the society. In this document, inclusive education became legally binding for all signatory nations and it provided a clear and an authoritative definition of inclusion: "Inclusion involves a process of systemic reform embodying changes and modifications in content, teaching methods, approaches, structures and strategies in education to overcome barriers with a vision serving to provide all students of the relevant age range with an equitable and participatory learning experiences and environment that best correspond to their requirements and preferences" (United Nations (UN), 2016, p. 4).

The adoption of the Convention was highly significant, as individuals living with disabilities, often remain victims of discrimination and deprived of equal educational opportunities. Hence, Article 24 (iv) and (v) of the Convention gave the people with disabilities a lease of life in education. It states that: (a) "Persons with disabilities receive the support required, within the general education system, to facilitate their effective education; (b) Effective individualized support measures are provided in environments that maximize academic and social development, consistent with the goal of full inclusion" (UN, 2006, p60). This presented a fundamental change to all countries, including the Kenyan government that has ratified the international agreements and are bound by its guiding principles. Member states endorsing the agreements have committed to transforming education systems by legalizing intervening strategies that focus on learners with special needs and disabilities (UN-CRPD, 2006).

The Government of Kenya, being a signatory to various international and regional frameworks for education, recognizes the right of every learner with disability to access education. This has been demonstrated through ratification and embracing of several international agreements and endorsing them into laws and policies geared towards organizational modification for access and participation of learners with disabilities. In 2009, the Ministry of Education in collaboration with key partners developed the Special Needs Education (SNE) policy framework (RoK, 2009) to ensure that students with

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disabilities receive equal access to special education services. The SNE policy framework is the guiding document for providing special education services in Kenya. Some of the objectives of SNE policy framework relevant to this study include the provisions of: (a) resources to make learning institutions accessible for learners with special needs and disabilities; (b) adequate and friendly buildings, furniture and equipment; (c) ensure safe environment and (d) ensure modified facilities of tuition, boarding and the sanitation. Consequently, the government recognizes the significant role of teachers in achieving Vision 2030, by adopting and designing structural readjustment interventions that enhance inclusive education (RoK, 2012). In order to implement crucial SNE policy strategies, the National Education Sector Plan (NESP, 2013-2018) recommended the review process, which culminated into the development of The Education and Training Sector Policy for Learners and Trainees with Disabilities (RoK, 2018), whose objective was to address the prevailing policy and implementation gaps on conducive and safe environment for learners with disabilities (RoK, 2018).

The challenges facing learners living with disabilities in Kenya were documented in policy as early as 1964, when the Ominde Commission made a recommendation which allowed for education and training for the disabled (Kochung, 2003; RoK, 1964). However, it was the Kenyan Constitution (2010) that made matters related to the marginalized, including individuals living with disabilities, highly pronounced (RoK, 2010). The education policies before and after realignment into the Kenyan Constitutions seem not to have fully benefited learners with disabilities, as many of them are still out of school (Kiiru, 2018). Despite the fact that policies to implement inclusive education are specified in Kenyan laws and policies, no study has been done to examine structural readjustment challenges in relation to the inclusive education policy. Hence, this research sought to fill this gap.

Research questions

This study was guided by the following research questions:

1) How many students with physical disabilities have been enrolled in public secondary schools in Tharaka-Nithi County?
2) To what extent have structural readjustment challenges affected the implementation of inclusive education policy in public secondary schools in Tharaka-Nithi County?
3) What strategies could be employed to minimize structural readjustment challenges in public secondary schools in Tharaka-Nithi County?

LITERATURE REVIEW

Policy elements influencing the implementation of inclusive education

Implementation of Inclusive education can only be predictable when all relevant policy elements that control the implementation process are put in place (Schuelka, 2018). This is because policy implementation is functional within the school structures through which policy objectives are put into practice. Some of the dilemmas connected with practices of inclusive education policy that are obvious during implementation are as a result of blunders made from the other stages (Gallup, 2017). Successful inclusive education policy implementation requires school transformation and systems change, for the purpose of learners to get education in a mainstream school (Schuelka, 2018). According to Mulugeta (2015), five elements influence implementation process namely; the policy content and the context through which the policy must be implemented; the commitment of implementers towards the policy, the capacity of the implementers to implement the policy and the support of policy consumers and partners whose interests are affected by the policy (Puhan et al., 2014; Tesfaye et al., 2013).

Policy content is one of the fundamental pillars on which structural modification on inclusive education policy are founded. The content of policy is generally viewed as a fundamental factor in creating the parameters and guidelines for policy implementation, although it does not determine the exact order of implementation process (Bell and Stevenson, 2015; Fullan, 2015). The policy content includes: what it sets out to be done; how it communicates about the problem to be solved and how it aims to resolve the problem. Commitment of policy implementers is usually assumed to be the most significant factor in policy objectives achievement process. Commitment is biased and very hard to measure, (Gallup, 2017). However, there are pointers that show the level of commitment of a school to a particular mission. One pointer is accomplishing responsibilities and assurances, especially when the school knows what its roles are towards policy implementation. Practices of policy may be noble, but if the implementers are reluctant to come up with effective strategies to carry it out, implementation will not occur (Mason, 2016; Pont, 2017).

Formation of policy consumers and partners, among those affected by the practice of policy is one of the most central components during the implementation process. The success or failure of practices of policy, in this case, structural modification interventions, depends on the support the policy produces among those who are affected (Hopfenbeck et al., 2015). Policy implementation researches have revealed that the understanding of any

public policy rests on the capability to implement it (Hess, 2013). It is mostly known that many development efforts are unsuccessful in many countries because they lack organizational ability to implement and sustain the practices of policy. Capacity is normally defined as the ability to accomplish policy functions, solve problems, set and realize policy objectives (Bell and Stevenson, 2015; Hopfenbeck et al., 2015). The general organization's ability includes structural, functional and cultural capacity to implement the policy objectives (Burns et al., 2016). An institutional (school) capacity to modify its strategies and systems to enhance accessibility for all learners is crucial to the implementation of inclusive education policy. These strategies include: authorization, financial investment, building an enabling environment, ethos, and the way the individuals and institution intermingle in the public sector and within the community as a whole (Bell and Stevenson, 2015). The school is a key player to the implementation of practices of inclusive education policy

Structural readjustment in schools

Structural readjustment is imperative for the success of inclusive education services. The quality and adequacy of structural modifications has a direct bearing on quality education, as they determine how effectively the curriculum is implemented (UNESCO-UIS, 2018). Learners with special needs and disabilities require a learner friendly environment to maximize their functional and academic potentials (Tirana, 2017). Schools need to be restructured in order to respond effectively to the needs of all learners. Adapting the school environment refers to adjusting the general school setting to encourage a barrier-free learning environment (The Organization for Economic Cooperation and Development, 2017, RoK, 2018). For example, the architectural structure of the classrooms and walkways, such as pathways on the school ground, should be made easily accessible for the mobility of learners living with disabilities (United Nations Children Emergency Fund, 2014). Consequently, adapting the whole school environment reduces the difficulties experienced by learners with disabilities. This can be done by creating a barrier free environment that increases the capacity to experience freedom in learning and accessibility (UN, 2018). The inclusive school ought to be pro-active relative to a variety of needs of all learners rather than reactive as an integrated education has been (Schuelka, 2018). In order to provide a truly inclusive school, the physical environment needs to be safe and accessible to all students, including those with physical and sensory disabilities (Hayes and Bulat, 2017). Issues relating to the structural readjustments can only be addressed at the planning stage and are concern for educational authorities, builders and architects (RoK, 2018). A school with learners with disabilities requires special resources to cater for their needs.

Collaboration among teachers and key stakeholders is also a critical factor in the implementation of inclusive education policy (RoK, 2009). Working in partnership with professional peers shows evidence of increased, varied instructional skills as well as decreased tendencies to make referrals to special education learners (Schuelka, 2018). Effectiveness of collaboration as a strategy is significant for improving student outcomes in inclusive settings. Researchers have documented the successful teaming up of teachers, inclusive service providers, and parents in implementing support plans for students with disabilities and those who are academically at-risk (Sifiso and Matome, 2018). Consistently, supported implementation of inclusive education policy resulted in increase in academic skills, engagement in class activities, interactions with peers, and student-initiated interactions for all learners (Hayley and Ingrid, 2019). Despite the enactment and domestication of international laws on inclusive education, there is still a big gap between policy frameworks and inclusive practices on the ground, (UNICEF, 2019). Schools need to put in place systems related to inclusive strategies in order to respond effectively to learners' educational needs and minimize barriers that hinder the implementation of inclusive education (Fullan, 2015).

Theoretical framework

This study was grounded on the Social Model of Disability. The model was developed and initially introduced in the mid-seventies by Mike Oliver, an activist in the Union of the Physically Impaired against Segregation (UPIAS), who adapted it from a union booklet published under the title: Fundamental Principles of Disability (Watson et al., 2012). The Social Model of Disability was developed in disapproval to what was alleged to be a damaging 'Medical Model' which perceives disability as predominantly a medical issue, entailing personal misfortune and necessitating treatment. In the context of the social model, impairment is perceived as a body defect such as a deformity of a limb (Goering, 2015). On the other hand, disability is considered as a drawback triggered by the society and prevents the people from participating in community life as a result of their impairment (Retief and Letšosa, 2018). This is a significant contrast, because the social model proposes that bodily function does not limit one's aptitudes; it is the society (Karen et al., 2018). In this perspective, there is nothing fundamentally disabling about having impairment. This marks an important theoretical paradigm shifts from the individualistic medical model with its emphasis on examination, therapy and re-integration to a more accommodating social justice

system where disability is not synonymous to inability (Leshota, 2013).

The social model theory is appropriate for this study as the model asserts that the challenges are found within the society (school), which create disability by restricting the functioning of an individual, and this has impacted negatively participation for individual learners with disabilities (Terzi, 2014; Owens, 2015). The model stresses that the restricting obstacles within the community arise from attitudinal, societal and environmental challenges, which block individual with disabilities from getting equal opportunities with their non-disabled colleagues (Beaudry, 2016). A school is an immediate learning environment of a student and has a great effect on quality education accessed by the learner. Inaccessible environment creates disability challenge that impacts negatively participation and quality education (Global Partnership for Education, 2018). For instant, a student in a wheelchair has no problem with their impairment until she/he encounters staircases. The stairs become a disabling challenge, that makes him/her not access a library located on the third floor, but this is not his/her fault, as the school favours only those who can walk (Owren and Stenhammer, 2013). The modification of a staircase into a ramp would enable a wheeled learner increase his/her participation in quality education (Mattie et al., 2015).

Moreover, the model is suitable to this study since it acknowledges the inclusive education policy which mandates all learning institutions to eliminate attitudinal, environmental, institutional and financial challenges which bar learners with disabilities from accessing quality education. The model also calls on schools to modify all the structural challenges so as to promote access and participation for learners with disabilities and this positively impacts their academic and social achievement (RoK, 2018). The transformation of an organization means creating a friendly and unprejudiced environment to give equal opportunities to all learners, regardless of their differences (Haegele and Hodge, 2016; Terzi, 2014). Changing conflicting perceptions towards disability decreases marginalization in all aspects of school life (Rees, 2017). By accepting and encouraging students to work together, irrespective of their differences, promotes self-esteem and self-perception, thus influencing both their academic and social life. Thus, the school embraces the uniqueness of each student, views impairment as a resource and appreciates and celebrates learners' diversity.

METHODOLOGY

Location of the study area

The study was carried out in Tharaka-Nithi County representing the forty-seven counties in Kenya. The county has two distinctive zones; a highland zone with many, highly-populated public secondary schools, and semi-arid lower zones with few poorly-populated schools. The zonal diversity influenced the number of school and respondents who participated in the study.

Research design

Mixed methods research approach was used in the study, in order to provide an in-depth and broad perspective on structural readjustment challenges facing the implementation of inclusive education policy in secondary schools in Kenya (Creswell et al., 2011). The advantage of using mixed methods research approach is that the researcher links the essentials of qualitative and quantitative approaches by drawing from the strong points of each method. A mixed-methods research enabled the researcher to gain a wider perspective and profound understanding of structural readjustment challenges facing inclusive education implementation. Within a mixed method research approach, the study specifically employed the convergent parallel technique, which involved collection and analyses of both quantitative and qualitative data separately in the same time-frame, analyzes the two components independently, and the results from the two data sets are merged for an overall interpretation. The aim of the convergent parallel technique was to develop a more understanding of structural modification challenges by comparing and contrasting various results from the same sources (Creswell et al., 2011).

Target population and sample size

Principals, teachers and secondary school students in Tharaka-Nithi County constituted the target population for this study. The sample population was obtained from all extra-county and county secondary schools who enrolled learners with disabilities (LWD), non-disabled learners, studying in the same classes with LWD and class teachers teaching learners living with disabilities. Aggregated data for learners living with disabilities presently or previously enrolled in public secondary schools were absent at the Education Offices in Tharaka-Nithi County, hence the researcher made calls to 56 secondary school principals of all the extra-county and county schools to find out whether they had enrolled learners with disabilities. Sixteen out of 56 schools had enrolled learners with physical challenges. The researcher targeted extra-county and county schools because they are well-resourced financially, physically and in human resources. Hence, the researcher felt that the schools were well endowed with physical and human resources necessary for the implementation of inclusive education policy without challenges. Learners with disabilities in sampled schools were purposively included for the interviews. Non-disabled students learning in the same classes were randomly selected to participate in focus group discussions

Research instruments

The research instruments for data collection in this study were semi-structured questionnaires for all the teachers, interview schedule for learners living with disabilities and focus group discussions for non-disabled learners. The questionnaire for teachers was developed to provide the quantitative data. The questionnaires had both closed ended and open-ended items. Closed ended items facilitated straightforward scoring of data and data analysis. Open-ended items gave teachers an opportunity to give their opinion and provide an in-depth information on structural modification challenges facing implementation of inclusive

Table 1. Population sampling frame.

S/N	Categorization	Type of school				Total
		Extra county		County		
		Male	Female	Male	Female	
1	School principals	4	2	6	4	16
2	Class teachers	16	21	19	28	84
3	Non-disabled learners	30	0	10	10	50
4	Learners with physical disabilities	6	0	2	3	11
	Total	**56**	**23**	**37**	**45**	**161**

Source: Field study.

education policy. The interviews for learners with disabilities were intended to give them chances to express their experiences in schools and focus group discussions for non-disabled learners studying in the same classes with LWD.

Data collection procedure

The researcher acquired ethical approval certificate from the Ethical Review Committee (Pwani University) and a research permit from the National Council of Science, Technology and Innovation (NACOSTI) before administration of the research instruments. This was because the study involved interviewing of the learners with physical disabilities. The researcher made courtesy calls to the Education Officers to be authorized to conduct research in schools in Tharaka-Nithi County. Sixteen (16) extra-county and county secondary schools were visited by the researcher. Detailed letters explaining the information on the research to be conducted were sent to principals of the selected schools. The researcher conducted the interviews with the learners with physical challenges, which was done on one-to-one basis. A total of 11 learners with physical challenges were interviewed; it took a duration of 10-15 min. The researcher also conducted 5 focus group discussions each with the 10 non-disabled learners, which lasted for 20-35 min. The focus group discussions were audio-taped so that the researchers could listen carefully to the responses later after the interview. Besides, using a tape recorder was considered significant to enable the researcher to concentrate on the participants' responses rather than taking notes.

Data analysis

Quantitative analysis was based on numerical dimensions of a specific aspect of the population. In the data analysis process, the raw data gathered from the questionnaires were keyed into SPSS version 20 in order to make inferences about the population using the information provided by the sample. Quantitative data were analyzed using descriptive statistics, that is, frequencies and percentages. Qualitative analyses involve obtaining comprehensive information about phenomenon being studied and establishing patterns and trends from the data collected (Creswell, 2014; Viswambharan and Priya, 2016). The researcher transcribed all interviews and organized them into meaningful categories, then grouped them into related codes. The coded information was organized into themes and presented in a narrative form. The data facilitated making conclusion and recommendations, including recommendations for further research.

RESULTS AND DISCUSSION

Instrument return rate

A total of 100 out of 120 teachers, constituting 83.3% response rate, completed and returned the questionnaires. On the other hand, 11 out of 13 learners with physical challenges were interviewed, which was 84.6% response rate. Similarly, 5 focus group discussions, each with 10 non-disabled students participated in the study as indicated in Table 1. The return rate of 75% and above was considered sufficient to provide information about a given population. Best and Kahn (2006) suggest that a 50% response rate is adequate, while 60 and 70% are good and very good respectively. The researcher made follow up telephone calls with the school principals to establish whether the questionnaires were ready for collection. Best and Kahn (2006) support the use of vigorous follow-up measures to increase the questionnaire return rate.

The research findings are presented according to the research questions summarized as follows:

1) Number of students with physical disabilities who have been in schools,
2) Structural readjustment challenges affecting the implementation of inclusive education policy,
3) Suggestions on how the schools can minimize structural readjustment challenges.

Number of learners currently/previously admitted in school

The first objective was to identify the number of students living with physical disabilities currently and/or previously enrolled in schools. Data from the 100 questionnaires filled by teachers teaching learners with disabilities revealed that there were 11 learners with physical disabilities currently enrolled while 30 students with physical disabilities were previously enrolled in County and Extra-county secondary schools. Table 2 presents

Table 2. The number of learners with physical disabilities currently or previously enrolled in schools between 2015 and 2018.

Learners with physically disabilities	Type of Public Secondary Schools																Total no. of LWD	Total no. of teachers
	Extra county								County schools									
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		
Presently enrolled	4	0	2	0	0	0	3	0	0	0	0	2	0	0	0	0	11	100
Formerly enrolled	2	8	0	6	1	2	0	2	1	1	1	0	2	1	2	1	30	

Source: Field Study: NB there are 18 extra-county and 38 county, 18% teachers had some form of special needs.

the number of learners currently or previously admitted in schools. The distribution of learners currently enrolled was six (6) in two extra-county schools and 5 in two County secondary schools. The distribution of LWD previously enrolled was seventeen (17) in four (4) extra-county schools while 13 were in 9 County schools.

As shown in Table 2, it is clear that there are few learners with disabilities enrolled in public secondary schools in Tharaka-Nithi County. Out of the 18 extra county schools only 6 (30%) schools had currently and/or previously enrolled LWD and 10 (26.3%) out of thirty-eight County schools had admitted learners with disabilities. From Table 2 above letter A-E represents Extra-county secondary schools while letter F-P represent County secondary schools. In each school, the number of learners with disabilities currently or previously enrolled is indicated. Only school A had four students with disabilities currently enrolled and two previously enrolled. This report implies that there are very few learners with physical disabilities that are either currently and/or previously enrolled in public secondary schools. The findings are in line with the studies that assert that although inclusive education policy is well stipulated to ensure students with disabilities receive quality education, schools are marred with low enrollments of students with disabilities. Moreover, limited access to appropriate education facilities for LWD continues due to insufficient teacher training on special needs education, geographic location of schools, inadequate physical resources, cultural perceptions, and weak identification and assessment procedures (Kiiru, 2018; Maiwa and Ngeno, 2017; Wafula et al., 2012).

Challenges in the implementation of inclusive education policy

Lack of modified physical resources

The second part of this study was geared towards finding out the structural readjustment challenges affecting the implementation of inclusive education policy. Responses from the majority (88%) of teachers cited lack of modified physical resources due to limited finances as a major challenge to inclusive education policy implementation. None of the schools had adequately created a conducive and learner-friendly environment for students with disabilities. School storey building housed key resource rooms such as libraries, computer rooms, classes and dormitories, lacked alternative ramped pathways and so they posed a real challenge for not only learners living with disabilities but also for teachers and non-disabled learners. The researcher climbed to the third floor with two students living with physical disabilities; to conduct focus group session in one of the form four classes and the struggle was quite evident. The findings of this study are consistent with other international studies. For instance, Debele (2017) found that seventy primary schools in Ethiopia, randomly selected for the study lacked accessibility in their physical environment to implement inclusive education. Similarly, the study findings by Hemmingson and Borell (2002) in Swedish school found that a total of 34 students with physical disabilities aged between 10 and 19 faced mobility limitations due to infrastructure barriers.

Similarly, Mizunoya et al. (2018) assert that initial achievement of school access and participation continues to be a significant challenge for most students with disabilities due to both structural and attitudinal barriers. Lack of accessibility among learners with disabilities has a negative impact on enrollment (Wodon et al., 2018) and completion rates compared to the peers without disabilities (Male and Woden, 2017). The study findings by Oliva (2016) found that lack of physical access for students with disabilities to key resource areas was a major academic challenge limiting many students form qualifying and accessing tertiary education. According to UNICEF (2015), learners with disabilities in Uganda face many difficulties in accessing the washroom, libraries, classroom, and playground. This impacts their safety and they are not able to use the facilities. Their learning is greatly affected. Grahaman (2014) asserts that learners with disabilities have not benefitted from the increase of education sector budget, in Tanzania, hence most of the schools have poor infrastructure. In another study, Mafa (2012) cited that in Zimbabwe, buildings in most schools were not accessible to learners with disabilities mainly those in wheelchairs. Such challenges make

implementation of inclusive education complicated and the situation was made more complex by cultural barriers and negative attitudes toward learners living with disability.

The study findings also revealed that lack of resources was another factor closely related to lack of modified physical resources. Several teachers cited quite a number of schools lacked teaching and learning resources. Consistent with the aforementioned, Chimhenga (2016)'s study cited inadequate resources in form of human, financial, infrastructural and material resources as the main challenge in implementing inclusive practices in Zimbabwe. In Kenya, lack of resources such as instructional materials impacted negatively the implementation of inclusive education (Mwangi and Orodho, 2014). Similarly, Thwala (2015) in Swaziland identified lack of appropriate teaching and learning aids that would be necessary for inclusion of learners with disabilities.

Attitude towards inclusive education policy by parents and guardians

Majority of the teachers (76%) revealed that attitude of parents and guardians on the implementation inclusive education policy was a key challenge. In one of the focused group discussion, it was revealed that during Annual General Meetings parents meet to discuss school developmental issues which require an addition of school fees. Parents, being the main education financiers, support school projects with a lot of caution; hence anything that changes the school budget is highly discussed before it can be approved. Parents mostly tend to support projects that benefit the whole school. One focus group stated the following:

"……parents do not support projects that benefit a few students. They count a great loss for such projects and will not support it due to high cost. For example, the school has several new buildings which lacked alternative ramped pathways in addition to the staircases, because they tend to increase the school budget (Probe) Messages from the AGM concerning increase of fees and other messages concerning the students are always communicated to us during assembly and even the amount of money added is communicated"

This implies that positive attitudes among key stakeholders are crucial towards the implementation of inclusive education policy and their perspective about the entire process is significant (Florian and Spratt 2013; Frankel et al., 2010; Singh, 2015). The Kenyan policy frameworks places parents and guardians as crucial education partners and collaborators whom the Ministry of Education works with in close association (RoK, 2009, 2012; 2018). During the implementation process various partners and players are involved, among which parents/guardians are core associates (Puhan et al., 2014; Tesfaye et al., 2013). Research has shown that parental attitudes are dependent on several aspects. A study by de Boer et al. (2010) found that parents' attitudes are more positive when they have some form of education and some experience of dealing with learners with disabilities. Similarly, a study by Schwab (2018) in Germany showed that parents' attitudes are dependent on the type of disability, whereby learners with physical and sensory disabilities are highly supported, compared to learners with behavioral problems; and severe cognitive disabilities are considered more cynical (Paseka, 2017; Schwab, 2018). Research on poor environmental conditions suggests that negative emotions among parents of children with disabilities are not merely related to the child but the stigmatization and segregation that bring about painful emotions, in Uganda and Zimbabwe (Van der Mark and Verrest, 2014).

Poverty among parents of children with disabilities

The study findings revealed that about 85% parents of learners with disabilities come from poverty-stricken families. Teachers revealed that involving such parents to discuss matters related to social and academic welfare of their children with disabilities is a real challenge. In resource mobilization, Ministry of Education (RoK, 2009) recognized this as a challenge by stating that "…. many parents cannot afford assistive and functional devices needed by learners with special needs and disabilities as they are expensive and out of reach". Besides, the researcher observed during the interviews that students with physical disabilities were using locally and sub-standard mobility devices, purely because their parents cannot not afford to purchase standard mobility devices. The implication is that most of the devices are weak and can cause injury to the users. This was confirmed by one learner living with one shorter leg:

"…….the shoe of my short leg was made by a shoe maker in the market. The shoe is a little bigger and slightly looks different from the other one. When it rains, walking becomes a challenge as the shoe slides on wet and muddy paths. Every time the other leg grows, the shoe maker keeps on adding small pieces of rubber to balance with the growing leg. Due to this, the original shape is totally distorted"

The findings of this study are consistent with other global studies. For instance, van der Mark et al. (2019) found in the study he conducted in South Africa, that understanding the impact of poverty on parenting a disabled child is essential for understanding parental attitudes towards inclusion. According to UN (2018) a

Table 3. Suggestions by teachers to reduce the structural readjustment challenges.

Suggestions for overcoming resource challenges	Frequency
Adequate modified school infrastructure	41
Availability of finances	45
Effective refresher courses for teachers on inclusive education policy	46
Continuous professional development and support	48
Effective coordination mechanisms	35

person living with disability is a significant factor leading towards poverty, lower economic levels and social well-being. Disability and poverty are intertwined and need to be handled accordingly. Persons living with disabilities lag behind non-disabled persons in every Sustainable Development Goal indicator (World Bank, 2015). A case study by Leonard (2018), involving in-depth interviews conducted with 23 families in Malawi found poverty is a dominant theme and it contributes greatly for learners not being in school, in class, or having problems with learning. In addition, Palmer et al. (2015), in their study found that disability in itself comes with extra costs, and it is a cause of economic difficulty for individuals and families. A study by Mwangi and Orodho (2014) in Kenya cited socio-cultural issues among parents as major contributing factors to the negative attitudes towards the implementation of inclusive education of learners with disabilities. Furthermore, parents living in poor conditions and lack of access to essential amenities are reported to cause additional worry and concern in Turkey (Yagmurlu et al., 2015). A similar observation was made by Mwangi (2013) where teachers seemed to be stressed up by the challenges arising from lack of support from parents with children living with disabilities. Such parents appeared withdrawn due to stigmatization, resulting from other people treating their children's condition as a curse. The implication may be that parents may choose to stay at home with the child to avoid stigma, or take their children with disabilities to school and disappear.

Lack of teachers' skills on special needs education (SNE)

Majority of the teachers (72%) indicated the lack of skills on special needs education among teachers as a major challenge to inclusion. The study found out that few teachers (19%) have some form of training in Special Needs Education (SNE), while the majority (81%) has only professional training in the subjects they teach in secondary schools, which is a requirement by the Government of Kenya. All teachers, whether trained in special education needs or not, are required to monitor the learners in their classes, and to identify those who have special education needs. The Ministry of Education policy frameworks (RoK, 2009, 2012, 2018) mandate all learning institutions to enroll all learners seeking admission regardless of their disabilities to access and participate in education. Teachers find teaching students with special needs a challenge because they are not trained to teach such learners. The findings of this study are in line with other studies which investigated teachers' skills on special education needs. For instance, a study by De Boer et al. (2011) shows that teachers have negative or neutral attitude towards the implementation of inclusive education policy as they feel incompetent to deal with issues related to learners with special education needs and disabilities. In confirmation, a study by Walton (2014) found that some teachers involved with students with disabilities found it challenging due to lack of formal training in special education. A study by Sibanda (2018) discovered that, even though several regular school teachers in Zimbabwe had not heard of inclusion and were never trained in special needs education, lacked comprehensive information and insights on inclusive education philosophy. Donohue and Bornman (2014) believe that lack of knowledge and skills among teachers is a major challenge in handling learners with a diverse education needs.

Teachers' suggestions on minimizing inclusive education challenges

The third question sought to identify the teachers' responses on ways of reducing the structural re-adjustment challenges as indicated in Table 3. From Table 3, 35 teachers suggested that effective and well-coordinated mechanism involving key stakeholders could increase the implementation inclusive education in schools. A significant, 48 teachers, cited continuous professional development for teachers to have confident when handling issues related to learners with special education needs. According to 46 teachers, provision of effective refreshers courses on inclusive education policy is vital to enable teachers implement inclusive education policy as mandated by Education Policy Frameworks (RoK, 2009, 2012, 2018). Further, 45 teachers revealed that availability of finances to enable the schools provide teaching and learning resources necessary for quality

education. Finally, 41 teachers cited a need to modify and restructure the school environment and infrastructure to provide a learner friendly environment. It is remarkable from the results that the teachers in the study had realistic suggestions for addressing issues related to the implementation of inclusive education in schools. Hence, the top managers in the schools, in collaboration with key stakeholders, have an integral role to strategize for the purpose of implementing inclusive education policy.

Conclusion

Various structural modification challenges facing the implementation of inclusive education policy in public secondary schools were evident. The findings suggest possible link between the structural modification challenges and weak implementation of inclusive education policy. Thus, the study concluded that lack of effective structural modification approaches in schools were major obstacles to the implementation of inclusive education policy.

The study also established that the existing inclusive education policy framework guidelines on structural modification in schools are weak. The conclusion drawn is that a weak policy framework undermines the development of effective structural modification approaches that positively influenced the implementation of inclusive education in schools. Thus, the study concluded that weak inclusive education policy guidelines on structural modification led to lack of modified physical resources, poor attitudes of key stakeholders, poverty and lack of teachers' skills on Special Needs Education, which contributed to poor implementation of inclusive education.

RECOMMENDATIONS

1) The Government of Kenya should design clear policy structural modifications guidelines to be followed by public secondary schools to facilitate effective, consistent and coherent structural modification programs. This will enable schools to strategize with key stakeholders in creating a learner-friendly environment.
2) The Ministry of Education should develop a master plan for school reforms premised on clear inclusive policies, structures and practices, anchored on structural modification guidelines at all levels of education systems that support sustainable implementation of inclusive education policy.
3) The County Education Board should establish an inclusive education coordinating committee in partnership with key stakeholders to identify and eliminate structural and systemic obstacles. This will enable them to promote policies and practices that support structural modification approaches necessary for the implementation of inclusive education in schools.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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