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Evaluation of Green Procurement Practices Among Mining Companies' Hospitals in Ghana: A Qualitative Analysis

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ABSTRACT: This study focuses on the evaluation of the green procurement practices among 7 mining hospitals in Ghana via qualitative analysis techniques. Thus, in this study, based on a 5-year case study, the practices of procurement officers in 7 hospitals belonging to mining companies in Ghana are explored. Within this period, interviews were conducted with key persons with recognizable responsibilities within the supply chain and procurement setup of the facilities. Details of their procurement practices, procedures, and policies were analyzed. A qualitative approach to organizational learning and practice is used to appreciate the existence of these differences observed and also to give a meaning to new perspectives on the challenges in establishing green procurement in the 7 mining companies' hospitals. The results of the analysis demonstrated that adjustments in the buyers' practices are not as much dependent on whether they understand, for instance, policies, tools, and procedures, but rather a matter of whether the buyers actually put their knowledge into practice.

KEYWORDS: green procurement practice, hospital items, mining companies' hospitals, qualitative analysis, Ghana

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Introduction

Environmental degradation is a key issue of concern for governments, societies, and business organizations in the world. According to Wolch et al.,¹ environmental degradation poses risks and reduces opportunities for the advancement of health care, especially for developing countries. The destructive environmental changes with negative tendencies are taking place in a progressively more globalized, industrialized, and interconnected world, with a growing global population and unsustainable production and consumption patterns. The deprivation of ecosystem is lessening development opportunities and could threaten the environment in future. However, environmental problems such as global warming, ozone depletion, solid waste disposal, and air pollution are on the increase. Business organizations are considered to be the source of most of the environmental issues.^{2,3} In Ghana, a key contributor to environmental degradation is the mining industry. However, these mining companies are considered as major contributors of income for economic growth of the country.⁴ The mining sector has been an important part of the Ghanaian economy, with gold accounting for over 90% of the sector. Ghana is the second largest gold producer in Africa and the ninth largest producer in the world. The sector directly contributed 38.3% of Ghana's total corporate tax earnings, 27.6% of government revenue, and 6% GDP in 2011.⁵ Anku⁶ indicated that the mining sector in Ghana has contributed an average of 5.5% to Gross Domestic Product (GDP) and 42% of total merchandise export in the

period 2000–2008, being the single largest contributor from 1991. However, Aşıcı⁷ observed that mining has led to high levels of environmental deterioration. The negative effects of mining on the environment and health are immeasurable and often difficult to quantify. Within the 7 mining companies' hospitals alone, procurement specialists purchase large amounts of products and services. The mining companies' hospitals are the major consumers of a wide range of goods and services ranging from electronic devices and surgical instruments to papers, towels, hospital gowns, packaging materials, and office supplies, to mention but a few. This has even necessitated the amendment of the Ghana's Public Procurement Act, Act 663 of 2003, to include sustainable elements such as environmental, social, and economic issues of sustainability in public procurement.⁸ Today, there has been a clarion call to accomplish another important mission, thus to promote sustainable economic development and to protect the environment. The sustainable procurement is closely related to sustainable development. It supports consumption behaviors that have no or little environmental impact and that are economically sound in the long run. The green procurement, also known as environmental procurement, eco-procurement, or green government procurement, is not a substitute to sustainable procurement, rather it is a sub-concept referring to the environmental aspect only.^{9,10} This creates more opportunities for sustainable procurement, allowing public authorities, 7 mining companies' hospitals and health care systems to use their



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massive purchasing power to choose socially responsible and environment-friendly products and services throughout the supply chain. On average, about 60% of all businesses' environmental impacts are embedded in the goods and services they buy from their upstream supply chain. As a result of this, the environmentally preferable purchasing (EPP) programs of the mining companies' hospitals have an enormous opportunity in reducing the overall environmental impact through green procurement practices.

Although mining industry supports the communities for economic reasons, it has been generally perceived as a socio-environmentally disruptive industry.¹¹ The severity of degradation of the environment through the conventional procurement activities of 7 hospitals of mining companies and their effects on the environment call for investigation and evaluation on how effectively the activities leading to the degradation of the environment can be controlled. With its huge expenditure, 7 mining companies' hospitals' use of green procurement practices will have significant leverage on adjusting the environment, resource, and economic development. This is one of the first studies that evaluated the green procurement practices among 7 mining companies' hospitals in Ghana. In this article, the authors have first reviewed the theoretical background of the study in section "Theoretical Background" of this work, and it further focuses on green procurement practices and learning as a method to facilitate green procurement practices; section "Materials and Methods" elucidated the methods and materials in the case study; section "Case Study: Green Procurement Practices" examined the case study on green procurement practices; section "Discussion: How to Encourage Green Procurement Practices" discussed the green procurement practices; and section "Conclusions" concludes the study.

Theoretical Background

The theoretical foundation for the analysis is made up of practice theory and learning theory. The practice theory is used to analyze how procurement actually occurs in the 7 companies' mining hospital's entities, whereas the learning theory is used with the aim of studying how these practices are able to transform conventional ways of procurement in the organization. According to Mosgaard,¹² the actual practice is impacted by situational demands and challenges, and is often difficult to predict in the formal procurement processes. The occurrence of modifications of the current procurement practices by the employees to execute their duties often depends on, practices and the descriptions in work manuals, job descriptions, and procedures.¹³ The mechanisms by themselves, mainly the procedures and guidelines for green procurement practices, can successfully be drawn into a sequence of simple and specific steps for the buyers/trading partners. Organizations would incorporate sustainable procurement with the quest of transforming strategies for conventional procurement and creating particular work directions for green procurement. The implementation of green procurement practice requires that the

traditional procurement is transitioned to green procurement to allow for the incorporation of current green procurement. Accordingly, the genuine practices must be considered while actualizing green procurement. Green procurement uses different sorts of tools and programs, than traditional procurement, as the buyers need to consider the environmental effects of the products and environmental appraisal before they purchase the goods or services. This appraisal can take different forms from the more simple considerations, for energy or environmental labeling of the items, to a more complex life phase. To execute green procurement in the 7 companies' mining hospitals, the organization must change their conventional procurement practices and perform the environmental appraisal of the items; they have to obtain some environmental capabilities. For the achievement of environmental benefits, the 7 companies' mining hospitals need to engage new environmental players in the mining hospital procurement framework.

Effects of procurement practices on the environment

Mangla et al¹⁴ investigated the concepts of environmental sound management and related it to green procurement practices such as vendor assessment, collaborative supply strategies, establishing environmental procurement policy, and supplier involvement to allow for improvement. Other related studies¹⁵⁻¹⁷ studied into the implementation and the evaluation of green procurement practices in other electronic organizations and offered a detailed investigation on the green procurement, green manufacturing, green distribution, and reverse logistics and to explore green procurement practices, measure green procurement performance, and green procurement coercion. One of the prominent issues of green procurement/green supply chain according to Dubey et al¹⁸ is that procurement of goods and services normally leads to extensive negative effects on public health and the environment. It is worthwhile to know that procurement and its related programs comprise both small and large scaled tasks and hence affect the environment in many ways. Nevertheless, procurement activities in a similar vein can be leveraged to conserve resources, mitigate pollution and waste, and promote a healthy economy by identification, usage, and dissemination of standards and practices that lessens or reduce destructive effects without compromising performance or cost-effectiveness.

Practices in public procurement

The practice theory refers to an idea that embraces what actually occurs in the organization; how employees function. To such employees, distinctive methods of working make sense and therefore practices can differ. In organization's understanding of how employees function is critical to the success of 7 mining hospitals,¹⁹ Nelsen²⁰ observed how employees' functions could bring conflicts on their work output because of certain practices in the organization. Companies normally see employees as though they performed their assigned tasks as per

their formal work set of expectations regardless of any accuracy.²⁰ The practice theory is mostly associated with how workers oftentimes complete the firm activity.²¹ In this way, practice theory normally depends on habits.²² However, the practices theory should be revised with the intention to actualize new initiatives; this is one of the arguments why changes can be difficult to implement. Practice theories were hard to identify as it depends on performance of given set of time. One of the ways in understanding the practices in the organization is through the explanations given by the employees. Such explanations may mirror the social setting within the organization.²³ Practices in group reveal knowledge into how practices can differ between groups, eg, different departments.²⁴ The practice theories in individual groups are sometimes established in social processes through communication. The correspondence between various groups can be tempting as they have distinctive practices.²⁴ Therefore, transformational processes initiated by 1 unit could be difficult to implement in other units. Conversely, as practice theories are deeply established in the social groups, it becomes a challenge to transform. The green procurement practices focus on how green procurement is done in the organization in a given situation. If, eg, there is a tradition of using local trading partners, this practice might continue even if the procurement procedures specify another practice. However, management support for continual evaluation of green procurement is important to green procurement practices.²⁵ The procurement practices incorporate the tradition of how to collaborate on procurement of goods and services across units, the choices considered when purchasing, and the priorities are therefore made by the procurement methods. Furthermore, this infers that procurement is an organizational skill in which the learning made in the social interaction is put into practice.²⁶ The supply chain pressure is normally exerted by customer demand, a factor for the 7 mining hospitals to evaluate green procurement in the organization.²⁷ For the purchase of minor goods and services and the inventory, network pressure to green procurement was more likely to influence the green procurement practices by the buyers²⁸; eg, the buyers' knowledge on the eco-names and green procurement intentions may influence these practices.²⁹ Similarly, the practices might be affected by the coordinated efforts between departments, eg, the inclusion of environmental issues in the procurement procedure.

Learning as an approach to changing procurement practice

Learning is the method that involves the transformation of current practices³⁰ in which the changes occur either by making knowledge available for employee's use or through social interaction. Learning is a broad theoretical concept that covers both cognitive and social process in which practice is developed through programs.³¹ Udimal et al³² posited that the process of

learning plays a key role in the entire procurement processes until the organization decides to incorporate green thinking of buying goods and services in the mining hospitals. From a cognitive perspective, learning is a procedure in which some employees transfer relevant information and knowledge to their colleague employees.³³ The information regarding green procurement is made known to the buyers by providing the suppliers with knowledge and tools through either formal or communications.³⁴ The green procurement in recent past has attracted a lot of attention.³⁵ Learning as a social phenomenon incorporates a more social and reflective perspective-based outcomes.³⁶ In this view, the learner is a player, who processes information and modifies his or her perceptions based on this theory. This means that the learner is a social being who learns through social collaboration within the group in which he or she finds himself or herself.³⁷ Learning is thereby the result of a social process of defining what to do, when to do it, and how it is related to existing organization's procurement practices. Changes in procurement practices occur through a social negotiation.³⁸ The social negotiation enables employees to examine their perceptions on each other in terms of improving their understanding. This implies that the players involved ponder on the changes between the buyers and the mining hospitals they belong,³⁹ and the existing practices impact on the employees' decision to accept new practices, especially under conditions of vulnerability.⁴⁰ Uncertainty of acceptance appears if the buyers do not understand the environmental issues of the 7 mining hospitals' procurement practices or how their procurement practices relate to the environmental management of the hospitals.⁴¹ The perception of environmental matters and initiatives is critical to employees' social communication so far as green procurement is concerned.⁴² The process in which practices are altered can be said to be a double-loop learning.⁴³ The single-loop learning seems to take place when the goals and procedures are underestimated and the emphasis is placed on making green procurement more efficient in the 7 mining hospitals. However, the double-loop learning includes scrutinizing the current procurement strategies and practices that point out the organization's objectives and strategies.⁴⁴ In double-loop learning, the present practices were questioned.

Materials and Methods

The empirical material presented in this section is based on case studies involving 3 central units and 7 entities. The study investigated the evaluation of green procurement practices in the 7 mining companies' hospitals in addition to the learning, occurring between departmental units in the 7 mining companies' hospitals in Ghana. A qualitative case study was employed, based on a narrative approach to make it possible for the study.^{45,46} The study employed interviews, written materials, and observations, such as participation in meetings, such as (1) when significant decisions related to green procurement are made, (2) changes in procurement procedures and practices, (3)

Table 1. A number of respondents for interviews at each entity (interviews were conducted at the entities and in the offices of the respondents).

	CENTRAL DEPARTMENT	ENTITY A	ENTITY B	ENTITY C	ENTITY D	ENTITY E	ENTITY F	ENTITY G
Purchaser/buyers	2	2 ^a	2	1 ^a	2	1 ^a	1	1
Environmental coordinator	3 ^a	1	1	1 ^a	1	1 ^a	1	1
Medical director	1	0	0	0	0	0	0	0

^aInterviews were supplemented with follow-up telephone interviews.

Table 2. Written material for case study.

MATERIALS COLLECTED	USE OF MATERIAL COLLECTED
Procedures from the environmental management guidebook: green procurement systems both centrally developed and locally adjusted forms. Trading partner information and questionnaires sent to trading partners. Environmental reports and green accounts from 2012 to 2017. Email and telephone correspondence with the central environmental unit. Information about the hospital, such as material from intranet and minutes from meetings.	Formal elements of green procurement in the hospital. The locally adjusted versions show how the procedure is implemented locally. The formal element of the green correspondence with the trading partner. General knowledge of how green procurement is prioritized in the hospital. Background material for conducting the interviews and to understand the historical reasons for certain events in the hospital. Background material to understand the historical reasons for implementing green procurement.

the practices were carried out by both the central and decentralized buyers, and (4) identifying practices of significance to green procurement in the 7 mining hospitals. Furthermore, these past events were discussed with the respondents. A new environmental purchasing procedure was introduced in the mining hospitals in June 2010 and the implementation process was followed until June 2013. From December 2010, the author has had a frequent dialog with the central purchasing unit and the central environmental unit in the 7 mining companies' hospitals. Table 1 shows the main data gathering for the case study that occurred between February 2008 and July 2012, where 25 interviews were made with respondents from both the entities and central units. Follow-up telephone interviews were conducted when additional information was required (supplementary to the first 25 interviews). Table 1 demonstrated the dissemination of the respondents among the entities. The empirical data were collected over a 5-year period. For first 3 years, the main data collection was related to the central units in the hospitals, and a follow-up was made on how they developed, modified, and implemented the new procurement green procedures. Twenty-one of the interviews in the entities were collected within 4 months period, and it is almost 3 years when the entities were acquainted with the purchasing procedure.

After this period, the main data collection focused on written material and meetings in the central units. This data collection approach infers that the progression of the implementation process in the entities was not followed progressively, but discussed in a retro perspective way with the respondents. The interviews were semi-structured^{47,48} and lasted between 50 minutes and 3 hours with an average of 2 hours. It is worthy to note that the study reported here has no overlap with the data sets reported in any previous studies. The main elements

addressed in the interviews were introduction and content of daily practices, the concept of environment and sources of knowledge on environmental issues, environmental communication practices with trading partners, internal communication processes, collaboration related to green procurement, and the possible improvements in green procurement practices, as an open question: things that the respondent might want to include or discuss. The interviews were recorded and transcribed. In connection with this study, the transcribed material was grouped into distinct themes. This approach was suitable for the identification of designs in the text.⁴⁹ Despite the fact that the respondents knew the subjects of the meetings ahead of time, they did not know the particular inquiries and exclusions in the interview. To enhance the precision of the result, the respondents were given the chance to review the copied text and verify the data. To enable them to get a more detail understanding of the green procurement practices and internal collaboration that is relevant to the green procurement practices, the interviews were supplemented with written materials (see Table 2). The observations were made through meetings with the focal environmental departments and the focal purchasing departments, and also meetings were arranged with the purchasers in entities E and F. These observations presented evidence into how communication regarding purchases occurs between the units. Notes were taken during and after the observations, and these notes were grouped according to the same categories as the interviews. In the same vein, the written material from Table 2 was classified. This approach permitted a careful investigation of each theme across the different sources of evidence. The number of respondents for the interviews at each entity is shown in Table 1. Interviews were conducted at the entities and in the offices of the respondents.

The results presented refer to individual respondents or staff categories. One of the limitations of case studies was based on qualitative interviews, observations, and the generalizability of written material. To take a broad view to other sectors or companies, it is important to compare with previous findings, thus increasing the possibilities of improving green procurement practices in the 7 mining companies' hospitals in Ghana.

Case Study: Green Procurement Practices

The evidence on green procurement implementation was collected by focusing on the employees, and their perception of green procurement. This was performed to ensure why certain practices occur in some entities, but not in other entities.

Introducing the case

The case study is a 7 mining companies' hospitals in Ghana with more than 1500 employees in total. The study incorporated in the analysis 7 entities. The management of those entities has chosen to integrate green procurement as a part of the environmental strategy of the mining companies' hospitals. There are 2 principle levels of procurement in the mining companies' hospitals; a central procurement unit and the individual entities. In the mining hospitals, the procurement of minor goods and services such as fuel, machinery, formaldehyde, hiring building constructors, and pesticides only takes place at the central purchasing units. The implementation of green procurement at this level is a little bit difficult as not too many employees were involved. Purchase of goods and services occurs in the entities. The different players are associated with green procurement in each of the entities. A purchasing unit handles the acquisition of goods and services and applies the centrally developed purchasing or buying agreements to their daily procurement of goods and services. Purchase of goods and services occurs regularly and is tied to the habits of the purchasers, and therefore, the practices of the purchaser come into focus. Each of the entities also has environmental, and health and safety facilitators. In some entities, the 2 tasks were managed by the local management. Both the local buyers and the environmental facilitators refer to as local management. A green procurement procedure specifies how the buyers should send an environmental assessment scheme to the trading partners, and afterward, they follow certain steps to assess the outcomes according to the procurement plan. This assessment leads to results, together with an assessment of price and quality on the basis for endorsing or disallowing the trading partner. The minimum requirements set for the environmental appraisals must be fulfilled for the suppliers to be approved, regardless of the cost and quality of the products and services. The environmental appraisal of local suppliers must be accepted and applied for before the mining hospitals purchase products or services from suppliers. This approval is then registered in the internal purchasing system, and then, the entities can then hire the services of the suppliers.

The current green procurement practices

The analysis mainly addresses not only the practices of green procurement in the separate entities of mining hospitals but also the communication between the local and central units. This communication is critical to the study of the learning procedure linked to the execution of green procurement. The entities have identical environmental procedures, because they are ISO 14001 certified with the same environmental guidebook. The items purchased and consumed, by the different entities, are supposed to meet the same environmental requirement, as specified in the green purchasing procedures.

Existing practices for trading partner assessments. The supplier evaluation questionnaires were well-known green procurement tools.⁵⁰ In the 7 companies' mining hospitals, the main tool for assessing the trading partners of goods was questionnaires sent by the local purchasers to every individual supplier. The buyers send the questionnaire to the trading partner, and if the appraisal demonstrates that the trading partner does not satisfy the predetermine requests, the trading partner is rejected in the process. There is a wider acceptance of the questionnaire among those buyers that have taken an interest in the purchasing system. It seems that the social interaction during this development process has brought about the mutual perception of green procurement, thus making the use of the questionnaires easier. Then again, the purchasers have set up green procurement as an organizational competence where the knowledge they have acquired through the social interaction was applied. As shown in Table 3, the rejection of trading partner due to environmental assessments only occurs in entities E and F. This may be indicated that even though the questionnaires were distributed to the suppliers or trading partners, no actual environmental benefits were obtained unless the purchasers actually follow-up on the surveys. This was supported by the following statement:

I do not really know if the communication leads to any modifications in the practices of the suppliers and I do not remember any exclusion of trading partners. (Buyer entity B)

The trading partner questionnaires were compulsory in the case of green procurement in the 7 mining companies' hospitals, but the procurers in 4 of the entities clarify that they do not find it to be pertinent to their daily procurement practices.

Purchase of minor goods and services is a process based on habits, and the buyers clarify that they evaluate and select trading partners in a transparent way as procurement is constantly practiced. As illustrated by the following quote, the questionnaires were seen as a vital tool by some buyers: "The environmental assessment needs to be a policy tool. This creates an unreasonable rivalry between the providers because of insecurity" (Buyer entity E). Nonetheless, only entities E, F, and G engage in sending out this supplier questionnaires and entity C never uses it. As the buyers explained: "The trading partner

Table 3. Practices related to supplier assessment in the individual entities.

	ENTITY A	ENTITY B	ENTITY C	ENTITY D	ENTITY E	ENTITY F	ENTITY G
Uses centrally developed purchasing agreements	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sends out supplier questionnaire	Often	Often	No	Often	Always	Always	Always
Rejects suppliers based on environmental assessments	No	No	-	No	Yes	Yes	No

assessment plans is mostly regulatory; we have never rejected anyone based on them" (Buyer entity C). "The environmental approval of product suppliers mostly leads to manual work. It does not make the suppliers alter their contractual agreement. Notwithstanding, quite a large number of suppliers have their environmental impacts under control" (Buyer entity A). Similar explanations were provided by entities A, B, C, and G, and it appears that the buyers help each other in this way, so that the questionnaires does not result in any improvements.

This gap existing between the activities prescribed in the formal systems and the actual green procurement practices can be clarified by the social process and social negotiation among the purchasers. The social process and negotiation affect the way in which the buyers relate to greener buying to their current practices in the 7 mining companies' hospitals. They support each other to maintain training that balances the intended practices in the green procurement processes. The centrally developed purchasing agreements apply to the procurement units, and they all involve health and safety matters when purchasing services or products for the 7 mining companies' hospitals. The social standards differ from the 1 identified to the supplier assessments. The buyers were positive toward the purchasing agreements, as these agreements make their job easier, and they require no evaluations themselves. This deduces that there was lack of vulnerability of how to implement the green procurement.

Environmental perception and its influence on procurement practices. The approach by which the buyers see environmental issues is not the same in the other procurement units. These differences can affect the green procurement practices as such practices make sense for the individual buyers. The central departments created policies based on a product-oriented method to green procurement, but for a vast majority of the entities, the environmental assessments depended on the environmental management initiatives that include environmental policies and environmental management systems. Table 4 demonstrates that the buyers in the entities A, E, and F have a life cycle perspective on green procurement, and the buyers in the remaining 4 focus on the production outputs. The accompanying statements indicate a very different perception of green procurement practices. The first statement from a buyer includes both life cycle viewpoint and occupational health and safety in ones perception of the environment:

Environment is our responsibility to the world we dwell in, both related to nature and humans, how we act on a regular basis. This includes, for instance using resources in their rightful way, reducing the number of chemicals, human welfare, and safety. (Entity F)

This product-oriented perception of green procurement is shared by the buyers and the environmental facilitators of the entity F. The respondents from entity F clarify that, they often with respect to green procurement, and the environmental facilitator, ensure that the buyers perform the green procurement assessments of suppliers. These collaborations help the buyers to make sense of green procurement for the 7 mining companies' hospitals.

However, there are additional buyers who perceive the environment as the "internal environment" with accompanying statements like, "the identification to the documentation of our practices from unused items that are burnt in the hospital's incinerator until the emissions leave the plant, and that the supplier can reciprocate same for the manufacture of their goods" (Buyer entity B).

Like the buyers, the local environmental facilitators perceive environmental issues in an unexpected way (see Table 4). Three of them (entities A, E, and F) have a life cycle or product-oriented perspective and concentrate on health and safety. Health and safety have been a concern area for a long period, and this influences the green intentions when buying, eg, raw materials for drug manufacturing. "We focused on occupational wellbeing and safety and it takes so much resources that, I think it has taken the steam out of the environmental effort" (Entity C). From the focal buying units' perspective, it was the intention to include life cycle concerns in green procurement. This means that, eg, environmental labels and energy consumption were included; the questionnaires from entities C, D, and G only concentrate on the environmental effects on the production. Entities A, B, E, and F include life cycle concerns when purchasing (see Table 4). These are the same entities that have a life cycle in understanding environmental issues, as opposed to focusing on the production output.

"When we were introduced to the green procurement procedure, its significance was determined by our facilitator, we have no reason not to trust in his judgment, He is the specialist" (Buyer entity E). Supplemented with the buyers' account of how they used green procurement in close cooperation with the local environmental facilitator was therefore obvious that the perceptions of the environmental facilitator influence the green procurement practices.

Table 4. Environmental perception in entities carrying out of green procurement practices.

	ENTITY A	ENTITY B	ENTITY C	ENTITY D	ENTITY E	ENTITY F	ENTITY G
Environment perception of buyer	Product-oriented	Internal environment	Internal environment	Internal environment	Product-oriented	Product-oriented	Internal environment
Environmental perception of local facilitator	Product-oriented	Product-oriented	Health and safety	Health and safety	Product-oriented	Product-oriented	Health and safety
Perceives green procurement as an essential part of the environmental determination	No	Yes	No	No	Yes	Yes	Yes
Includes life cycle concerns when purchasing	Yes	Yes	No	No	Yes	Yes	No
Includes the state of wellbeing and safety mechanisms when buying	Yes	Yes	Yes	Yes	Yes	Yes	Yes

An explanation of this is that the environmental facilitators were held in trust as the specialists, concerning green procurement, and in this manner, they can influence the social standards with the end goal of encouraging learning and the use of green procurement practices.

Knowledge and practice related to green procurement. The collaboration between the different groups of practice is an approach of gaining environmental learning, and thereby, it influences how to implement green procurement. Table 5 shows to what extent the individual entities interact with each other. Except in entities C and G, the buyers interact as often as possible with the environmental facilitator regarding green procurement, and the buyers in entities A, B, F, and G additionally tend to use the system created through green purchasing ventures, for instance, concentrating on environmental criteria for the acquisition of paint. In these sub-entities' assignments, both buyers and employees take interest:

We have ended up, being mindful of environmental matters, because we are working with it, we know much more than we knew before. By participating in projects it becomes easier to see the purpose of environmental initiatives, but it can be troublesome, for instance even a scavenger at one of seven mining companies' hospitals kitchen to have knowledge about it. (Buyer entity B)

The buyers have picked up a typical impression of environmental issues through their interest in buying groups. Being a part of this group that practices green procurement influenced them to present green procurement in their local units too. The buyers say that the participation in these entities' project groups have given them a better knowledge on green procurement that they can also apply to their daily practices and thereby reduce the uncertainty that is associated with changing procurement practices: "The projects in the buying group have made us all specialized within certain areas, and we know who to call to get help" (Entity F). In entity F, neither the buyer nor the environmental facilitator has an environmental education.

This implies that the impression of environmental issues mainly depends on the specific rules and goals in the environmental

management system. On the positive side, the buyers know who to ask in case of doubt and were not afraid to do such a thing. They both have the freedom to learning how to perform green procurement, and this may clarify why they have actually managed to execute green procurement in entity F. The local management in the 7 mining companies' hospitals entity handles green procurement in an astonishing way. Majority of them do not interfere much, yet, at some entities, the buyers felt that the management were not helpful: "Our top manager disclosed to us that, everything cannot be focused on environmental issues, and there must be space for the 'small' suppliers, this statement makes it difficult for us to enforce the procedures" (Entity C). In entities C and D, the buyers feel that the management was not helpful in the green procurement implementation. The buyers found out that the management support is critical as they inspire for changing their procurement practices; if the buyers are evaluated in terms of economic performance, this may lessen green procurement practices.

Discussion: How to Encourage Green Procurement Practices

The development of green procurement practices can be encouraged by investigating, what makes certain practices happen in individual entities, and to use this information for evaluating in the practicing of green procurement in the 7 mining hospitals in Ghana.

Expanding on the current practices of procurement

For 5 of the 10 interviewed buyers, applying the supplier surveys ended up as a known practice. For others, their current procurement practices do not make way for green procurement practices, as they tend to think about quality and cost as the fundamental components when buying. The buyers find it very essential to make the most bargains possible each time they embarked on procurement, yet to some of them, it includes considering environmental matters. Along with this line, the buyers have a different guideline for what a decent bargain is. Furthermore, the buyers have various levels of knowledge on environmental matters. A double-loop learning process is

Table 5. Green procurement practices and environmental perceptions of significance to green procurement in the entities.

	ENTITY A	ENTITY B	ENTITY C	ENTITY D	ENTITY E	ENTITY F	ENTITY G
Uses local access to environmental knowledge	Yes	Yes	No	Yes	Yes	Yes	No
Support from local management	Yes	Yes	No	No	Yes	Yes	Yes
Participates in green purchasing projects	Yes	Yes	No	No	Yes	Yes	Yes

required, and the current practices ought to be addressed. Thus, there should be environmental education to encourage the transformation of the social standards with respect to purchasing, and to facilitate environmental commitment within 7 mining companies' hospitals.

The purchasing practices normally extend to a product-oriented understanding of procurement; quality and price are assessed regarding the expected lifetime of the product and the volatility of chemicals. At this point, when the suppliers' appraisals were focused on the environmental performance, but not the items, they frustrate the green procurement practices and cannot be incorporated in the current procurement practices. This is lucid with the discoveries of Russel,⁵¹ who contends that green procurement should include environmental features and templates for the goods and services.⁵²

A few of the buyers clarify that the green procurement has not actually led to environmental improvements among the suppliers, as the suppliers do not change in their environmental effort or provide different products. The strategy for evaluating the appropriate responses from the providers was the only way to understand how green procurement leads to real outcomes, and as long as the buyers appreciate environmental issues, there is no purpose for scrutinizing the present practices. Notwithstanding the perception that green procurement does not prompt any genuine change in fulfilling environmental matters, no double-loop learning takes place. A plethora of studies have demonstrated that expectations of customer requests were drivers of green procurement (Walker et al²⁷). There was no supply chain pressure from customers or other players to the green procurement of minor goods and services. This might influence the buyers' perception that they only engage in green procurement as a result of internal procedures, not because suppliers value it.

At entities E, F, and G, the buyers discovered that their responsibilities were of importance in the environmental performance of the 7 mining companies' hospitals, and the remaining 3 find that their responsibilities were not important from the environmental point of view. The aim of the suppliers' assessments was not clearly defined in the procurement guideline, and as a result, several interpretations occurred at the same time in the 7 mining companies' hospitals. To some degree, the buyers refused to recognize that the trading partner evaluations are of relevance to the 7 mining companies' hospital. One of the arguments for this is that the buyers normally evaluated the

amount of products and services they purchased than the suppliers themselves. Thereby, the green procurement practices differ from the normal procurement practices. At this point, there was a need for addressing the environmental goals of the 7 mining companies' hospitals to make the employees become aware of the importance of green procurement.

Changing the environmental opinion to impact procurement practices

The buyers' views with respect to green procurement vary from 1 entity to the other, except in entities C and D—their opinions depended on how the local environmental facilitator introduced green procurement. In entities A, B, C, E, and G, the environmental facilitators were the buyers' main source of environmental knowledge, and they were therefore involved in applying green procurement. Where the interaction between the local environmental facilitators and the buyers was regular, their opinions had a positive impact on the green procurement practices. The buyers have effectively transformed their procurement practices and scrutinized the environmental criteria, which they generally applied in procurement by including the environment as an additional factor. Lack of training and commitment was seen as a hindrance to green procurement,⁵³⁻⁵⁵ and the interaction with the environmental facilitators frowns on this. The environmental facilitators perform their functions as middle agents between the focal units and the buyers, and in doing so, they encourage double-loop learning process. A detailed outline of the green procurement procedures clarifies why green procurement is of significance to the 7 mining companies' hospitals in encouraging the buyers learning how to perform green procurement. It is not a hard thing to acquire knowledge, but putting the knowledge into practice through social negotiation is what should be seen of 7 mining companies' hospitals.^{56,57} The environmental facilitator could act as a backbone to improving green procurement practices if he or she has the necessary environmental knowledge. At that point, the buyers can approach him or her for direction on environmental issues, yet he or she may also be the one exhibiting and assisting them to appreciate new environmental initiatives. This neutralizes the barrier recognized by Scur and Barbosa³⁹ about the absence of appreciating how to fuse green thinking into organization for buying goods and services.

Encouraging green procurement through support and improved knowledge

Management support was seen as a key factor of green procurement practices. Management support varies in the management entities. These practices vary from the local management appeals to the buyers, not to disregard environmental issues when purchasing, on the contrary. Some studies have observed that green transport or cleaning services can reduce cost, whereas the procurement of, eg, green paper or degradable disposable bins, can be expensive. Nonetheless, the top management sometimes does not choose the green alternatives when they are buying. The support from the top management is therefore important for social standards and real practices for organizational transformation and sustenance. To the local management, financial resources might be a deterrent factor, so environmental issues might not be a highest priority to the mining hospitals; this could be translated to failure in the environmental assessment. For this situation, the local managers rely on existing habits and are therefore resistant to change.²³

This means that 1 target area for improving the green procurement practices is by persuading the local management of its significance to the 7 mining companies' hospitals to ensure that the environmental goals are made much clearer. It is therefore not the existence of supportive of formal elements that needs to be changed, but how the top management supports them. This should be possible through reward power such as positive appraisals of green procurement practices or incentives for the buyers. What is required is really a double-loop learning process where the supervisors question their existing practices and support a change. A supportive management structure can support the purchasing department on the creation and evaluation of green procurement. For management to support green procurement, it is essential to incorporate green objectives in the 7 mining companies' hospitals' procurement practices. If the local management is measured only in terms of the economic performance and not the environmental initiatives, that might end up with conflicting goals. The support from central units of the procurement entity should be able to encourage the implementation of green procurement practices. The entities' proximity to the central environmental unit (entity E) had a closed cooperation with the central unit, which ensured follow-up on its green procurement practices. The buyers explained that this is of significance to the execution of green procurement. However, there was an absence of monitoring and follow-up on the green procurement of the other individual entities. The focal environmental units have concentrated on developing procedures and focal purchasing agreements, as opposed to catching up, rather than on the local implementation in the 7 mining companies' hospitals' entities. It is important to speed up on the changes in practices and procedures, and some degree of follow-up is essential to ensure that green procurement is on the agenda of

the individual entities procurement plans. The environmental facilitator can facilitate a learning process when, eg, introducing a new purchasing procedure. In entities E and G, the buyers explained that a detailed presentation of the supplier's assessment plan have given rise to improved procurement practices. In entities C and D, these have changed neither their view of a decent bargain nor the actual procurement practice. For those initiatives that are introduced as a direct continuation of the current practices, changes have thus occurred faster. One case is that the centrally created buying agreements now included green initiatives. All 7 entities use these buying agreements. For the individual buyer, the practice has not changed much; he or she applies the buying agreements in the same way, as he or she is used to. The main difference is that some goods, such as liquid soaps and theater gloves, are now produced in different brands, because of the environmental awareness on the product. Considerably, the buyers incorporate green procurement by changing their conventional procurement practices, which were not identified as part of the green procurement agreements. However, applying the centrally created buying agreements may not facilitate any learning²³ with green procurement; the buyers simply continue their practices of using the centrally created buying agreements without reflecting on the environmental endorsement of the suppliers. The green procurement practices identified with the procurement of minor goods and services in these entities vary in that, and the environment was considered as a key issue to implementing green procurement practices. The central buying department seems to have difficulties in understanding why the differences in green procurement practices look like, as the similar procedures and implementation measures are applied to all entities. This implies that some entities do not comply with the 7 mining companies' hospitals' procurement policies. The fact that the formal descriptions and work procedures are identical implies that the explanation of the different purchasing ought to be found in the internal network of the 7 mining companies' hospitals as it depends on the specific organizational context in each entity. The customers of the same entities and the external networks do not provide a possible explanation either. The collaboration in the buying groups strengthens the execution of green procurement practices. The lack of understanding of how to integrate green thinking into buying is perceived as a barrier.⁵⁸ Green procurement can be seen as an organizational capability where knowledge is translated into practice. It is, however, challenging for the buyers to apply knowledge because green procurement is seen by the buyers as "something other than what's expected" from ordinary acquiring practice. Some of the buyers have taken keen interest in green procurement practices, and these have affected their practices on their day-to-day procurement assignments. This is because they know how to actualize the green procurement practices and the importance of doing so. This can be viewed as a learning process,⁵⁹ or

learning through practice, as each buyer transfers his or her knowledge in environmental friendliness and opinions to the other buyers to sustain the green procurement practices in the 7 mining companies' hospitals.

Those buyers do not just implement a procedure, but they actually challenge the priorities used in evaluating green procurement practices in the 7 mining companies' hospitals. The green procurement has turned into an organizational skill among buyers, and the practices also turn into a limited spanner.¹² To ensure that, green procurement becomes an organizational skill in all 7 mining hospitals' entities, it was necessary to include the buyers in the entities' purchasing groups where they can acquire experience and practice green procurement. This can be viewed as a learning process,⁵⁹ or learning through training, as every buyer transfers his or her experience in green procurement practices to other buyers.

Conclusions

Green procurement can be seen as an organizational ability that is turning information into learning. Learning by doing is one method of encouraging green procurement, that is to say, differentiating particular undertakings or product groups where the buyers work together to perform green procurement. Learning through training enables the buyers to challenge their current procurement practices as double-loop learning. The habits and practices of employees are often linked to the performance of organizational tasks. Hence, the buyers require support to really apply the green procurement initiatives, and not simply being educated about them. However, encouraging green procurement in the 7 mining companies' hospitals can be to educate the local environmental unit to ensure they appreciate the significance of green procurement practices with the ultimate goal of supporting the purchasers or buyers both within and outside the 7 mining companies' hospitals. Follow-up and support from relevant players with environmental knowledge are fundamental for the buyers to change their procurement practices. Organizational practices depend on habits, and the changes do not occur just by changing the corporate strategies and procedures. Corporate strategies are drivers of green procurement only if the strategies include social standards of how to engage in purchasing and if they are incorporated in the 7 mining companies' hospitals with respect to decent bargaining in green procurement. To encourage an adjustment in the social standards, continual follow-ups were fundamental. In addition, it is important for 7 mining companies' hospitals in Ghana to look at the specific criteria of the green procurement to ensure that the procurement practices actually comply with the organizational objectives, as the implementation of green procurement can differ within the 7 mining companies' hospitals. Local management support will help to encourage the buyers to implement green procurement practices. If the local managers perceive green procurement as an expense, they will not be able to create a supportive

management structure. Green procurement practices should be encouraged and accepted as a vital activity. This implies that the environmental importance of using green procurement should be clear to both management and buyers so that green procurement practices can be seen as an avenue for ameliorating environmental issues, but not that implementing green procurement in the 7 mining companies' hospitals was an expensive venture in terms of cost. The current purchasing practices were built on a product-oriented understanding of procurement; quality and price are assessed regarding the expected lifetime of the purchased items and the evaporation of chemicals. When green procurement is employed, it often revolves around environmental performance of the supplier, not the items, and the current practices being used. For it to be in line with the current buying practices, it is imperative to consider how to execute products that are environment-friendly, ie, setting environmental requirement for the products, not the trading partners themselves and so on. One method required for the transition to green procurement is to address it as a collaborative process involving employees with the goal to changing their procurement behaviors and practices instead of introducing a final procedure of how to execute them. Consequently, the current procurement practices were taken into consideration when developing green procurement strategies in the 7 mining companies' hospitals. This analysis demonstrated that in the entities where the buyers were engaged in building up the green procurement systems and where a product-oriented method was decided, green procurement was easily implemented. In a more general term, the closer you can get to making green procurement a natural characteristic in the development of the current practices, rather than totally changing the method, the easier it is. The use of green procurement is not a new research subject, but this study evaluates why a gap is created between the formal policies, organizational structures, and the actual practices of the buyers. Using green procurement practices as a theoretical starting point allows us to evaluate what really happens in the 7 mining companies' hospitals through a narrative approach. The evaluation of green procurement practices in the 7 mining companies' hospitals revealed why certain procurement practices in the entities differ, but also how these practices can be changed. It should be mentioned that the data collection method explains that the dynamism of the implementation process in the entities of the 7 mining companies' hospitals was not followed in real time, but discussed in a retro perspective manner with the respondents. The green public procurement includes the same aspects as a regular business-to-business procurement and is well managed in nature. The public organizations, eg, government hospitals buy a lot of similar products and services. The qualitative approach applied in this study might help to understand the gap between the actual practice of green procurement, government hospitals' formal policies, and regulations on green procurement practices. Future study should look at

investigating the green procurement as more sustainable than the current procurement being practiced. Furthermore, future study should also address the significance of the decentralized versus centralized developed purchasing agreements, when performing the environmental evaluations of products and services and the trading partners.

AUTHOR CONTRIBUTIONS

PBS: Conceptualization, Methodology, Formal Analysis, Writing- Original draft. JGD: Supervision, Project Administration, Funding acquisition.

IAM: Writing-review and editing, Data curation, Visualization.

HAA: Data Curation, Writing-review and editing.

REFERENCES

1. Wolch JR, Byrne J, Newell JP. Urban green space, public health, and environmental justice: the challenge of making cities "just green enough." *Landscape Urban Plan.* 2014;125:234-244.
2. Crane A, Matten D. *Business Ethics: Managing Corporate Citizenship and Sustainability in the Age of Globalization.* Oxford, UK: Oxford University Press; 2016.
3. Rozar NM, Mahmood WHW, Ibrahim A, Razik MA. A study of success factors in green supply chain management in manufacturing industries in Malaysia. *J Econ Bus Manag.* 2015;3:287-291.
4. Killick T. *Development Economics in Action Second Edition: A Study of Economic Policies in Ghana.* Abingdon, UK: Routledge; 2010.
5. Mugo BN. *Effect of Green Supply Chain Management Practices on Performance of Tea Factories in Central Region Kenya.* Nairobi, Kenya: KCA University; 2017.
6. Anku EK. *Green National Accounting: A Case of Ghana's Mining Sector.* Accra, Ghana: University of Ghana; 2014.
7. Asıcı AA. Economic growth and its impact on environment: a panel data analysis. *Ecol Indic.* 2013;24:324-333.
8. Jayant A, Tiwari A. Impact of green supply chain management practices in India. *J Ind Mech.* 2018;2:1-14.
9. Asare C. *The Role and Effect of the Entity Tender Committee in Sustainable Procurement Practices in Public Hospitals in Ghana.* Kumasi, Ghana: KNUST; 2017.
10. Witjes S, Lozano R. Towards a more circular economy: proposing a framework linking sustainable public procurement and sustainable business models. *Resour Conserv Recycl.* 2016;112:37-44.
11. Doh ZK. *Sustainable Procurement Practice in Ghana Health Service.* Kumasi, Ghana: KNUST; 2015.
12. Mosgaard MA. Improving the practices of green procurement of minor items. *J Clean Prod.* 2015;90:264-274.
13. Cross RL, Parker A. *The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organization.* Boston, MA: Harvard Business Review Press; 2004.
14. Mangla SK, Kumar P, Barua MK. Risk analysis in green supply chain using fuzzy AHP approach: a case study. *Resour Conserv Recycl.* 2015;104:375-390.
15. Hsu CC, Tan KC, Mohamad Zailani SH. Strategic orientations, sustainable supply chain initiatives, and reverse logistics: empirical evidence from an emerging market. *Int J Oper Prod Manage.* 2016;36:86-110.
16. Lo SM. Effects of supply chain position on the motivation and practices of firms going green. *Int J Oper Prod Manage.* 2013;34:93-114.
17. Mathiyazhagan K, Govindan K, Noorul Haq A. Pressure analysis for green supply chain management implementation in Indian industries using analytic hierarchy process. *Int J Prod Res.* 2014;52:188-202.
18. Dubey R, Gunasekaran A, Ali SS. Exploring the relationship between leadership, operational practices, institutional pressures and environmental performance: a framework for green supply chain. *Int J Prod Econ.* 2015;160:120-132.
19. May C, Finch T. Implementing, embedding, and integrating practices: an outline of normalization process theory. *Sociology.* 2009;43:535-554.
20. Nelsen BJ. Talking about machines: an ethnography of a modern job. *Ind Labor Relat Rev.* 1998;51:538-540.
21. Garris R, Ahlers R, Driskell JE. Games, motivation, and learning: a research and practice model. *Simul Gaming.* 2002;33:441-467.
22. Nonaka I. A dynamic theory of organizational knowledge creation. *Organ Sci.* 1994;5:14-37.
23. Brown JS, Duguid P. Organizational learning and communities-of-practice: toward a unified view of working, learning, and innovation. *Organ Sci.* 1991;2:40-57.
24. Wenger E, McDermott RA, Snyder W. *Cultivating Communities of Practice: Guide to Managing Knowledge.* Boston, MA: Harvard Business Press; 2002.
25. Sarkis J. A boundaries and flows perspective of green supply chain management. *Suppl Chain Manage.* 2012;17:202-216.
26. Cicmil S, Marshall D. Insights into collaboration at the project level: complexity, social interaction and procurement mechanisms. *Build Res Inform.* 2005;33:523-535.
27. Walker H, Di Sisto L, McBain D. Drivers and barriers to environmental supply chain management practices: lessons from the public and private sectors. *J Purchas Suppl Manage.* 2008;14:69-85.
28. Hall J. Environmental supply-chain innovation. *Green Manage Int.* 2001;35:105-120.
29. Pedersen ER, Neergaard P. Caveat emptor—let the buyer beware! Environmental labelling and the limitations of "green" consumerism. *Bus Strateg Environ.* 2006;15:15-29.
30. Lave J, Wenger E. *Situated Learning: Legitimate Peripheral Participation.* Cambridge, UK: Cambridge University Press; 1991.
31. Garrison DR. *E-learning in the 21st Century: A Framework for Research and Practice.* Abingdon, UK: Taylor & Francis; 2011.
32. Udimal TB, Jincai Z, Ayamba EC, Sarpong PB. Human capital accumulation and its effect on agribusiness performance: the case of China. *Environ Sci Pollut Res.* 2017;24:22091-22101.
33. Ipe M. Knowledge sharing in organizations: a conceptual framework. *Hum Resour Dev Rev.* 2003;2:337-359.
34. Glasgow RE, Klesges LM, Dzewaltowski DA, Bull SS, Estabrooks P. The future of health behavior change research: what is needed to improve translation of research into health promotion practice? *Ann Behav Med.* 2004;27:3-12.
35. Vachon S, Klassen RD. Extending green practices across the supply chain: the impact of upstream and downstream integration. *Int J Oper Prod Manage.* 2006;26:795-821.
36. Jonassen D, Land S. *Theoretical Foundations of Learning Environments.* Abingdon, UK: Routledge; 2012.
37. Easterby-Smith M. Disciplines of organizational learning: contributions and critiques. *Hum Relat.* 1997;50:1085-1113.
38. Tharp RG, Gallimore R. *Rousing Minds to Life: Teaching, Learning, and Schooling in Social Context.* Cambridge, UK: Cambridge University Press; 1991.
39. Scur G, Barbosa ME. Green supply chain management practices: multiple case studies in the Brazilian home appliance industry. *J Clean Prod.* 2017;141:1293-1302.
40. Armitage D. Adaptive capacity and community-based natural resource management. *Environ Manage.* 2005;35:703-715.
41. Carter CR, Rogers DS. A framework of sustainable supply chain management: moving toward new theory. *Int J Phys Distr Logist Manage.* 2008;38:360-387.
42. Székely F, Knirsch M. Responsible leadership and corporate social responsibility: metrics for sustainable performance. *Eur Manage J.* 2005;23:628-647.
43. Argyris C. Single-loop and double-loop models in research on decision making. *Administ Sci Quart.* 1976;21:363-375.
44. Barlow J, Jashapara A. Organisational learning and inter-firm "partnering" in the UK construction industry. *Learn Organ.* 1998;5:86-98.
45. Flick U. *An Introduction to Qualitative Research.* Thousand Oaks, CA: SAGE; 2014.
46. Mason J. *Qualitative Researching.* Thousand Oaks, CA: SAGE; 2017.
47. Dearnley C. A reflection on the use of semi-structured interviews. *Nurs Res.* 2005;13:19.
48. Louise Barriball K, While A. Collecting data using a semi-structured interview: a discussion paper. *J Adv Nurs.* 1994;19:328-335.
49. Mosgaard M. *Green Procurement: A matter of Organisational Change in Elsam.* Aalborg, UK: Aalborg University; 2008.
50. Hervani AA, Helms MM, Sarkis J. Performance measurement for green supply chain management. *Benchmarking.* 2005;12:330-353.
51. Russel T. *Greener Purchasing: Opportunities and Innovations.* Abingdon, UK: Routledge; 2017.
52. Denjean B, Dion J, Huo L, Liebert T. Green public procurement in China. 2015.
53. Mathiyazhagan K, Govindan K, Noorul Haq A, Geng Y. An ISM approach for the barrier analysis in implementing green supply chain management. *J Clean Prod.* 2013;47:283-297.
54. Sourani A. Barriers to addressing sustainable construction in public procurement strategies. 2011.
55. Walker H, Jones N. Sustainable supply chain management across the UK private sector. *Suppl Chain Manage.* 2012;17:15-28.
56. Bohari M. *Exploring the Potential for Green-Oriented Procurement in Building Projects: A Case of the Malaysian Construction Industry.* Brisbane, QLD, Australia: Queensland University of Technology; 2017.
57. Russill MR. *A Short Guide to Procurement Risk.* Farnham, UK: Gower Publishing Ltd; 2012.
58. Giunipero LC, Hooker RE, Denslow D. Purchasing and supply management sustainability: drivers and barriers. *J Purchas Suppl Manage.* 2012;18:258-269.
59. Parker SK, Bindl UK, Strauss K. Making things happen: a model of proactive motivation. *J Manage.* 2010;36:827-856.