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المعهد العالي للعلوم والتقنية شحات

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الشروط العامة لضمان الموافقة على النشر:

- الاهتمام بأصالة المحتوى.
- التأكد من عدم نشر البحث في أي مجلة أخرى.
- التأكد من اتباع أخلاقيات البحث في الإعداد.

هـيـئـة تـحـريـر الـمـجـلـــة

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كلمة رئيس التحرير

افتتاحية العدد السابع

بسم اللّه الرحمن الرحيم

الحمد للّه رب العالمين، والصلاة والسلام على أشرف المرسلين، سيد الخلق سيدنا محمد وعلى آله وصحبه والتابعين. وبعد:

يسرُّ أسرة تحرير مجلة السلفيوم للعلوم والتقنية أن تقدّم لكم العدد السابع، والذي يمثل إضافة نوعية في مسيرتنا نحو تعزيز البحث العلمي في مجالات العلوم والتقنية المتنوّعة.

في هذا العدد، نستعرض مجموعة من الأبحاث المحكّمة والمقالات العلمية التي تجسّد جهودًا متميزة لباحثين من مختلف التخصُصات، سواء في العلوم الأساسية، والهندسية، الموارد البشرية، أو العلوم البيئية. كما نسلط الضوء على آخر التطوُرات العالمية في المجالات التقنية، ساعين إلى ربط النظرية بالتطبيق وإثراء الحوار العلمي بين الأكاديميين والمهتمين.

نتوجّه بالشكر الجزيل لكلّ من ساهم في إخراج هذا العدد، من محكّمين ومؤلفين، وفريق التحرير والنشر، كما نخصُّ بالامتنان قراءنا الكرام على ثقتهم ودعمهم المستمر، وحيث نسعى من خلال "**السلفيوم**" إلى أن نكون جسرًا للمعارف الحديثة ونافذة للإبداع العلمي.

واللّه ولي التوفيق

والسّلام عليكم ورحمة اللّه وبركاته

د.منصور سالم عبدالرواف

رئيس التحرير

أهداف المجلة

- تختص المجلة بنشر نتائج الأبحاث والدراسات والمقالات التي يقوم بها أو يشترك في إجرائها أعضاء هيئات التدريس والباحثون في الجامعات والمعاهد العلمية ومراكز البحوث وهيئات البحث العلمي في مجالات العلوم التكنولوجيا (والعلوم المرتبطة بها).
- التطوير المستمر في أساليب النشر والتحكيم والتبادل العلمي مع الجهات المحلية والخارجية
- المساهمة في رفع ترتيب المعهد العالي للعلوم والتقنية شحات بين الجامعات والمعاهد العليا في ليبيا.
- المنافسة مع المجلات العالمية المتخصصة واحتلال مكانة رفيعة بينها.

رسالة المجلة

- نشر الأبحاث العلمية وفق معايير منضبطة بما يحافظ على الأصالة، والمنهجية، والقيم العلمية، ويدعم الإبداع الفكري.
- التميز في تقديم البحوث ذات الأفكار المبتكرة والتي لم يسبق نشرها بمجلات علمية أخرى والمحكمة بواسطة نخبة من العلماء والمتخصصين والإسهام في إخراج بحوث علمية متميزة، وتتحقق رسالتنا من خلال الالتزام بالمعايير العالمية للتميز في مجالات البحث العلمي.

رؤية المجلة

- الريادة العالمية والتميز في نشر البحوث الرائدة المبتكرة الأصيلة؛ لتكون خيار الباحثين الأول لنشر بحوثهم العلمية.
- توثيق ونشر الثقافة العلمية بين الباحثين والتواصل العلمي في مختلف مجالات العلوم التقنية.
- تشجيع قنوات الاتصال بين المختصين في شتي مجالات العلوم والمؤسسات الإنتاجية والتعليمية.
- الارتقاء بمستوى العلوم والأبحاث التطبيقية لخدمة المؤسسات الإنتاجية بليبيا وتطويرها باستحداث الأساليب والوسائل المستخدمة من خلال إصدارات المجلة.

قواعد النشر بالمجلة

- يتم تقديم البحوث المعدة وفقا لشروط المجلة بإرسالها الى البريد الإلكتروني الخاص بالمجلة التالي:
((SJST@ISTC.EDU.LY)) (نسخة الالكترونية واحدة ملف Word).
- تقبل المجلة البحوث العلمية الأصيلة ذات الأفكار المبتكرة والتي لم يسبق نشرها بمجلات أخرى او مؤتمرات وذلك للنشر باللغة الا نجليزية مع ملخص باللغة العربية أو باللغة العربية مع ملخص باللغة الا نجليزية.
- يمكن تقديم البحوث للنشر بالمجلة بعد إعدادها حسب قواعد كتابة البحث الخاصة بالمجلة.
- تنشر البحوث في المجلة حسب أسبقية ورودها وقبول المحكمين للبحث وإعدادها من قبل الباحثين ومراجعتها من قبل هيئة التحرير في أول عدد يصدر عقب انتهاء هذه الإجراءات.
- يرسل البحث بعد استلامه الى اثنين من المحكمين في ذات التخصص وتستعجل تقارير المحكمين بعد شهر من تاريخ إرسال البحث الى المحكم ويسند تحكيم البحث الى محكم أخر عند تأخر التقرير عن شهرين.
- يرفض نشر البحث إذا رفض المحكمين البحث أما إذا كان الرفض من محكم واحد فيرسل البحث لمحكم ثالث ويكون رأيه هو الفيصل.
- بعد قيام الباحث بإجراء التعديلات المطلوبة من قبل المحكمين يرسل البحث الى أحد أعضاء هيئة التحرير للمطابقة.
- يعرض البحث في صورته النهائية علي الباحث (الباحثين) قبل وضعه Online في موقع المجلة.
- يتم طلب دفع رسوم التحكيم من قبل الباحث وطلب صورة عملية التحويل بإرسالها الى البريد الإلكتروني الخاص بالمجلة.
- يتم إبلاغ الباحث ببريد الكتروني رسمي بإتمام عملية النشر في حال إكمال كافة الإجراءات السابقة وإنجاز عملية النشر الفعلي في عدد المجلة و يحصل الباحث على نسخة إلكترونية من العدد الذي اشتمل على البحث المطلوب نشره.
- يجب أن يشتمل البحث على الأقسام الآتية: العنوان ، المؤلف(المؤلفون) ، الكلمات المفتاحية، الملخص (بلغة البحث) ، المقدمة ، طرق البحث ، النتائج و المناقشة و التوصيات، المراجع (يجب فصل النتائج عن المناقشة) ، وأخيرا ملخص باللغة العربية أو الإنجليزية (ليست اللغة المستخدمة لمتن البحث) و يستعمل برنامج Microsoft Office على ورق مقاس A4.

مواصفات تنسيق البحوث:

- يتم استخدام خط Times new Roman حجم 12 لمحتوى البحث واستخدام مسافة 25.1 بين أسطر النصوص، ويتم اعتماد خط 12 غامق اللون (Bold) للعناوين الرئيسية ، و10 لعناوين الجداول والرسومات، ويتم استخدام حجم خط 14 لعنوان الدراسة في الصفحة الرئيسية و12 لأسماء الباحثين علي أن تضبط الهوامش على مسافة 5.2 سم من جميع الاتجاهات.
- يتم كتابة أسماء الباحثين بالترتيب الطبيعي (الاسم الأول ثم الأب ثم اللقب) لكل منهم شاملة جهات عملهم و يحدد اسم الباحث المسئول (Corresponding Author) عن المراسلات بعلامة* ويذكر العنوان الذى يمكن مراسلته عليه وعنوان البريد الالكتروني.
- يجب أن لا يزيد عدد صفحات البحث عن 25صفحة وفي حال زيادة عدد الصفحات عن المذكور فسيتم إضافة رسوم وفقا لحجم الزيادة مقارنة بعدد الصفحات المحددة في المجلة.
- يجب إرفاق ملخص مكون من 250-300 كلمة باللغتين العربية والإنجليزية، بالإضافة إلى ضرورة توفير ما لا يقل عن 4 كلمات مفتاحية لمحتوى الملخص العربي والإنجليزي.

البحوث التي احتواها العدد السابع

اولا: البحوث العربية:

التعليم الفني والتقني في ليبيا وسبل تطويره بما يلبي احتياجات سوق العمل

هدى عمر عمران

تأثير المعالجات الحرارية عند درجة حرارة الأوستنيت على الصلادة والموصلية الكهربائية للصلب الكربوني عالي الكربون

شريفة المبروك عبد المولى، رجاء سعد عثمان مؤمن

ديناميكية العناصر الغذائية الكبرى خلال تحلل الأوراق الإبرية البنية لأشجار الصنوبر الحلبي (Pinus halepensis Mill)في منطقة الجبل الأخضر/ ليبيا

حورية سعد محمد، فرج بدر عبد الكريم وميكائيل يوسف الفيتوري

استخدام وسائل التواصل الاجتماعي كأداة للتعرف على المواقع السياحية والمقصد السياحي من وجهة نظر طلاب الكليات والمعاهد السياحية

عبد الباسط علي عبد الجليل، بلعيد محمد يونس، وليد خليل التاجوري

دراسة استخدام نسب مختلفة من تفل ثمار الخروب في تغذية أسماك البلطي النيلي وتأثيره في الأداء ومكونات الجسم

عبد الباسط حسين إبراهيم فضيل، سالمة إبراهيم أحمدي أمجاور، إبراهيم صالح ميلاد القريولي

ثانيا: البحوث الانجليزية

Simple Design Of Analogue Signals Frequency Meter

Othman Mohammed, Tahani Abdalmawla, Aboubakr Adim

The relationship between green human resources management (GHRM) and service quality

Rafi A. S. Embarak & Abd Alwanis A. S. Almabruk

The Cumulative Capacity of Acacia Cyanophylla Trees for Heavy Metals in Shahat Forest, Libya

Younes Hamad Sheip & Khaled Saad Al-mokhtar

The relationship between green human resources management (GHRM) and service quality

*Rafi A. S. Embarak**

Department of Business Administration, College of Economics/University of Derna / Al-Qubba Branch, Libya

Abd Alwanis A. S. Almabruk

Department of Business Administration, College of Economics/University of Derna / Al-Qubba Branch, Libya

Corresponding Email: **r.embark@uod.edu.ly**

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The relationship between green human resources management (GHRM) and service quality

Rafi A. S. Embarak[1*], Abd Alwanis A. S. Almabruk[1]

[1] *Department of Business Administration, College of Economics/University of Derna / Al-Qubba Branch, Libya*

Corresponding Email: **r.embark@uod.edu.ly**

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ABSTRACT

In recent decades, human activities have increasingly negatively impacted the environment, driven by factors such as globalization and intensifying competition. In response, a modern approach to Human Resource Management (HRM), known as Green Human Resource Management (GHRM), has emerged. GHRM aims to integrate eco-friendly practices into organizational operations while maintaining business competitiveness. This study contributes to the existing body of knowledge by exploring the impact of GHRM on service quality within small and medium-sized enterprises (SMEs) in Tripoli, Libya. A quantitative research methodology was adopted, with data collected through a survey administered to a randomly selected sample of 100 employees working in various SMEs in Tripoli. Ethical approval was obtained from the relevant Libyan authorities, and the surveys were distributed both electronically and in person, in compliance with institutional permissions. The collected data were analyzed using multiple regression analysis to test the study's hypotheses. The findings indicate that employees in Libyan SMEs possess a moderate understanding of GHRM practices. Furthermore, the results demonstrate a statistically significant positive relationship between GHRM and service quality. Based on these findings, the study recommends that service-oriented industries prioritize the adoption of GHRM practices to enhance service performance, improve organizational outcomes, and promote environmental sustainability.

***Keywords**: GHRM, Human Resources, Libyan SMEs, Service Quality, Sustainability, Tripoli.*

العلاقة بين إدارة الموارد البشرية الخضراء وجودة الخدمة

رافع عبد الله صالح امبارك[1*]، عبد الونيس عبد الحميد سعد المبروك[1]

[1]قسم إدارة الأعمال، كلية الاقتصاد / جامعة درنة / فرع القبة، ليبيا

r.embark@uod.edu.ly*

الملخص

في العقود الأخيرة، ازداد التأثير السلبي للأنشطة البشرية على البيئة نتيجة عوامل متعددة، أبرزها العولمة وتزايد حدة المنافسة. وفي هذا السياق، برز نهج حديث في مجال إدارة الموارد البشرية يُعرف باسم "إدارة الموارد البشرية الخضراء" ، والذي يهدف إلى تعزيز الممارسات الصديقة للبيئة مع الحفاظ على القدرة التنافسية للشركات. تسعى هذه الدراسة إلى الإسهام في الأدبيات الأكاديمية من خلال استكشاف تأثير إدارة الموارد البشرية الخضراء على جودة الخدمة في المؤسسات الصغيرة والمتوسطة في مدينة طرابلس، ليبيا. اعتمدت الدراسة منهجية كمية، حيث تم جمع البيانات من عينة عشوائية مكونة من 100 موظف يعملون في مؤسسات صغيرة ومتوسطة في طرابلس، وذلك باستخدام استبيان تم تصميمه خصيصًا لهذا الغرض. بعد الحصول على الموافقة الأخلاقية من الجهات المختصة في ليبيا، تم توزيع الاستبيانات إلكترونيًا وورقيًا وفقًا للإجراءات المؤسسية المعتمدة. ولاختبار فرضيات الدراسة، تم تحليل البيانات باستخدام أسلوب الانحدار المتعدد. كشفت النتائج أن موظفي المؤسسات الصغيرة والمتوسطة في ليبيا يمتلكون فهمًا معتدلًا لمفهوم إدارة الموارد البشرية الخضراء، كما

أظهرت أن لهذا النهج تأثيرًا إيجابيًا ذا دلالة إحصائية على جودة الخدمة. بناءً على هذه النتائج، توصي الدراسة بأن تعطي القطاعات الخدمية أولوية لتطبيق ممارسات إدارة الموارد البشرية الخضراء لتحسين جودة خدماتها، وتعزيز الأداء التنظيمي، ودعم تحقيق الاستدامة البيئية.

الكلمات المفتاحية: إدارة الموارد البشرية الخضراء، الموارد البشرية، المؤسسات الصغيرة والمتوسطة، جودة الخدمة، الاستدامة، طرابلس.

INTRODUCTION

The effects of globalization have led to significant environmental changes and the depletion of natural resources, raising serious concerns about the future. In response to these challenges, businesses have begun to adopt green practices to mitigate their environmental impact (Smith & Lewis, 2017; Johnson, 2019). Human resources management has long been recognized as a crucial component in achieving sustainability within organizations. It has become evident that integrating environmental factors into human resource practices is essential for fostering a culture of sustainability. Implementing sustainable business practices enables companies to maintain their competitive edge while contributing positively to the environment.

Previous studies have emphasized the role of supportive managerial behaviors in promoting green human resource practices within organizations (Renwick et al., 2016). For instance, studies have shown that the implementation of green training programs significantly increases employees' environmental awareness and commitment to sustainability goals (Tang et al., 2018; Jabbour et al., 2019). Moreover, businesses that adopt green human resource management practices, such as green recruitment and performance management, often report enhanced organizational performance and improved employee satisfaction.

This study aims to investigate the extent to which green human resource management practices impact service quality in small and medium-sized enterprises (SMEs) in Tripoli, Libya. Given the scarcity of research focusing on the application of green human resource practices in the Libyan SME context, this study seeks to fill this gap and provide valuable insights for both academia and practitioners. The findings are expected to demonstrate that adopting green human resource management practices can significantly enhance service quality and organizational sustainability in SMEs, thereby offering a competitive advantage in the market.

Additionally, companies that embrace green practices are generally perceived as having a stronger brand image and a more substantial market presence (Delmas & Pekovic, 2018; Shah, 2019). Rewarding employees for their environmentally friendly behaviors has been shown to boost organizational commitment and job satisfaction (Ahmad, 2015; Yong, Yusliza, & Ramayah, 2020). In this competitive environment, it is crucial for organizations to enhance employee awareness and motivation regarding environmental issues to remain viable and successful.

One of the primary challenges faced by SMEs, especially in developing countries like Libya, is maintaining competitiveness amidst the pressures of globalization. To survive and thrive, these businesses must maximize their outputs while minimizing inputs, and human resources management plays a critical role in this process (Nawangsari & Sutawidjaya, 2019; Senyucel, 2018; Mullins, 2019). By adopting green human resource management practices, SMEs can improve employee motivation and productivity, reduce operational costs, and ultimately, enhance service quality.

This research is particularly relevant as it is among the first to explore the impact of green human resource management on service quality within the context of Libyan SMEs. It is anticipated that the findings will contribute significantly to the literature on green human resource practices and provide a practical framework for implementing sustainable management strategies in similar settings.

HUMAN RESOURCES MANAGEMENT

Green Human Resources Management

Green Human Resources Management (GHRM) is a strategic approach that integrates environmental management into traditional human resource practices, aiming to enhance both organizational performance and sustainability (Jackson, Renwick, Jabbour, & Muller-Camen, 2011; Zoogah, 2011). The concept was introduced as a means of aligning HRM with environmental goals, focusing on practices such as green recruitment, green training, and green performance management (Renwick et al., 2013; Opatha & Arulrajah, 2014). GHRM seeks to minimize the negative environmental impact of business operations by promoting sustainable practices among employees and fostering a corporate culture that values environmental responsibility (Kim, Kim, & Choi, 2019). This integration helps organizations to not only comply with environmental regulations but also to create a competitive advantage by improving their reputation and operational efficiency.

The adoption of GHRM practices has been shown to significantly influence employee attitudes and behaviors, leading to improved job satisfaction, organizational commitment, and overall performance (Dumont, Shen, & Deng, 2017; Pham et al., 2019). For example, green recruitment practices attract environmentally conscious employees, while green training programs enhance employees' awareness and competencies related to environmental management (Yusliza, Ramayah, & Othman, 2015; Jabbour, Santos, & Nagano, 2010). Furthermore, green performance management and reward systems can motivate employees to engage in environmentally friendly behaviors, thereby contributing to the organization's sustainability goals.

Green Human Resources Management in Healthcare Services

The application of GHRM in healthcare services is particularly critical due to the sector's substantial environmental footprint. Healthcare facilities generate a significant amount of waste, including hazardous materials, and consume large quantities of energy and resources (Jabbour & Santos, 2008; Jackson et al., 2011). Implementing GHRM practices in healthcare can help reduce environmental impacts through initiatives such as green procurement, waste management, and energy-efficient facility management. GHRM in healthcare also focuses on engaging healthcare professionals in sustainability efforts, promoting green behaviors, and integrating environmental objectives into clinical and administrative practices.

Studies have shown that adopting GHRM in healthcare settings not only improves environmental performance but also enhances the quality of patient care by creating a safer and healthier workplace (Longoni, Golini, & Cagliano, 2014; Pham et al., 2019). For instance, green training and development programs educate healthcare staff about sustainable practices such as reducing energy consumption, minimizing waste, and using environmentally friendly products (Govindarajulu & Daily, 2004; Ahmad, 2015; Zibarras & Coan, 2015). Additionally, green

recruitment and selection processes can ensure that new hires are aligned with the organization's sustainability values and goals.

Integrating GHRM into the healthcare sector is crucial for fostering a culture of sustainability that extends beyond compliance and involves all stakeholders, from management to frontline staff (Kapil, 2015; Yong et al., 2020). This holistic approach helps healthcare organizations to not only reduce their environmental impact but also to improve organizational performance, employee engagement, and patient satisfaction.

SERVICE QUALITY

Service quality is a critical factor in determining the success and competitiveness of organizations, particularly in the service sector (Parasuraman, Zeithaml, & Berry, 1988; Grönroos, 1984). It refers to the ability of an organization to meet or exceed customer expectations consistently. Service quality is generally evaluated based on several dimensions, including reliability, responsiveness, assurance, empathy, and tangibles (Cronin & Taylor, 1992; Zeithaml, Berry, & Parasuraman, 1996). These dimensions help in assessing how well a service is delivered in comparison to what customers expect (Urban & Pratt, 2000; Mehta & Durvasula, 1998). High service quality not only enhances customer satisfaction but also leads to greater customer loyalty and positive word-of-mouth, thereby contributing to the long-term success of the organization.

In the context of small and medium-sized enterprises (SMEs), especially in developing economies like Libya, service quality plays a pivotal role in building customer trust and reputation. Due to limited resources and market challenges, maintaining high service quality is crucial for SMEs to differentiate themselves and remain competitive. For Libyan SMEs, delivering consistent and high-quality service can lead to customer satisfaction, retention, and business growth, which are essential for their survival and success in a competitive market.

Several models have been developed to measure service quality, with the Service Quality (SERVQUAL) model being one of the most widely used (Cronin & Taylor, 1992; Jain & Gupta, 2004). SERVQUAL evaluates service quality by comparing customer expectations with their perceptions of the actual service received (Seth, Deshmukh, & Vrat, 2005; Kasiri et al., 2017). The gap between these two measures provides insights into areas where service improvements are needed (Parasuraman et al., 1988; Ladhari, 2009). Other models, such as the Service Performance (SERVPERF) model, focus on performance-based measures of service quality, arguing that customer perceptions of service performance alone are sufficient to assess quality.

For SMEs in Libya, understanding and improving service quality requires a customer-centric approach, where businesses actively seek feedback and continuously work on enhancing their service delivery processes. This approach not only helps in meeting customer expectations but also in identifying and addressing any service gaps, thereby leading to improved customer satisfaction and loyalty.

THE EFFECT OF GREEN HUMAN RESOURCES MANAGEMENT ON SERVICE QUALITY

Green Human Resources Management (GHRM) has been recognized as a strategic tool to enhance not only environmental sustainability but also organizational performance, including service quality (Renwick et al., 2013; Pham et al., 2019). By integrating environmental objectives into HR practices such as recruitment, training, and performance management,

organizations can foster a culture of sustainability that permeates all levels of the organization. This alignment between GHRM and service quality is particularly significant in service-oriented sectors, where the quality of service delivery directly impacts customer satisfaction and loyalty.

The implementation of GHRM practices can positively influence service quality in several ways (Jabbour et al., 2010; Yong et al., 2020). First, green recruitment and selection processes attract employees who are committed to sustainability, thereby ensuring that the workforce is aligned with the organization's environmental goals (Ahmad, 2015; Zoogah, 2011). This alignment enhances employees' sense of purpose and motivation, which in turn improves their service delivery and customer interactions. Moreover, green training programs increase employees' awareness and knowledge of sustainable practices, enabling them to deliver services that are not only efficient but also environmentally friendly.

Incorporating GHRM into performance management systems further strengthens the link between sustainability and service quality (Dumont et al., 2017; Yong, Yusliza, & Ramayah, 2020). By setting clear environmental objectives and evaluating employees based on their contributions to these goals, organizations can reinforce the importance of sustainability in their daily operations (Jackson et al., 2011; Jabbour & Santos, 2008). Reward and recognition systems that acknowledge employees' green initiatives can also enhance their commitment to providing high-quality, sustainable services.

In the context of small and medium-sized enterprises (SMEs) in Libya, where resource constraints and environmental challenges are prevalent, adopting GHRM practices can be particularly beneficial. By integrating sustainability into their HR practices, Libyan SMEs can improve not only their environmental performance but also their service quality, which is crucial for maintaining customer trust and competitiveness in the market (Elbaz & Haddoud, 2017; Abid & Ahmed, 2020). For example, implementing green training and development programs can equip employees with the skills and knowledge needed to reduce waste and improve the efficiency of service delivery, thereby enhancing overall service quality.

Overall, the adoption of GHRM practices can lead to a significant improvement in service quality by creating a workforce that is engaged, motivated, and aligned with the organization's sustainability goals (Yusoff, Nejati, & Kee, 2018; Zaid et al., 2018). This, in turn, can result in higher customer satisfaction, loyalty, and a positive organizational reputation. As such, GHRM serves as a valuable strategy for SMEs in Libya to enhance their service quality while contributing to broader environmental and social objectives.

METHOD

Population and Sample of the Research

The population of this study comprises employees working in small and medium-sized enterprises (SMEs) located in Tripoli, Libya. These SMEs operate in various sectors, including manufacturing, services, and retail, and play a significant role in the local economy. The types of companies included in this study are small-scale manufacturing firms producing goods such as textiles and food products. Due to practical constraints such as time, accessibility, and resource limitations, a convenience sampling method was used to select participants. The sample size was determined to be 100 employees, representing different positions such as managers, administrative staff, and operational employees. This sample size was calculated based on Krejcie and Morgan's (1970) sample size determination table, which recommends a sample size of 100 for a population of 1,500 to achieve a 95% confidence level with a 5% margin of error.

Additionally, this sample size aligns with similar studies in the field of GHRM and service quality, ensuring the findings are statistically reliable and generalizable to the broader population of SMEs in Tripoli. This sample is considered sufficient to provide an initial understanding of the relationship between green human resources management (GHRM) practices and service quality in Libyan SMEs.

Data Collection Tools

Data for this study were collected using a structured questionnaire, which was divided into two primary sections to measure the independent and dependent variables. The questionnaire was developed based on established scales from the literature, ensuring reliability and validity in the measurement of the constructs.

1. Green Human Resources Management (GHRM) Scale: The independent variable, Green Human Resources Management (GHRM), was measured using a 28-item scale adapted from Jabbour (2010) and Shah (2019). This scale assesses the extent to which various GHRM practices are implemented in the organization across the following seven dimensions:

- **Green Job Design (4 items):** Measures the incorporation of environmental sustainability in job roles and responsibilities (e.g., "My job includes responsibilities that focus on environmental sustainability").
- **Green Recruitment and Selection (4 items):** Assesses the extent to which green criteria are integrated into the recruitment and selection process (e.g., "The organization considers candidates' environmental values during recruitment").
- **Green Training and Development (4 items):** Evaluates the provision of training programs aimed at enhancing employees' environmental awareness and skills (e.g., "The organization provides training on environmental management practices").
- **Green Performance Management (4 items):** Measures the inclusion of environmental objectives in performance evaluation and management systems (e.g., "Employees are evaluated based on their contribution to environmental sustainability").
- **Green Compensation Management (4 items):** Assesses the alignment of compensation and reward systems with environmental performance (e.g., "Employees receive rewards for their environmental contributions").
- **Green Occupational Health and Safety (4 items):** Evaluates practices aimed at ensuring workplace safety and health in an environmentally friendly manner (e.g., "The organization promotes safety measures that also consider environmental impact").
- **Green Employee Relations (4 items):** Measures the efforts to engage employees in sustainability initiatives and promote environmentally friendly behaviors (e.g., "The organization encourages employees to participate in environmental initiatives").

Each item was rated on a 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree").

2. Service Quality Scale (SERVQUAL): The dependent variable, Service Quality, was measured using the SERVQUAL scale developed by Parasuraman, Zeithaml, and Berry (1988). This scale, consisting of 22 items, assesses service quality across five dimensions:

- **Physical Attributes (4 items):** Evaluates the appearance of physical facilities, equipment, and personnel (e.g., "The organization's facilities are visually appealing").
- **Assurance (4 items):** Measures the ability of employees to instill confidence and trust in customers (e.g., "Employees have the knowledge to answer customer questions").
- **Responsiveness (4 items):** Assesses the willingness of employees to help customers and provide prompt service (e.g., "Employees are always willing to help customers").
- **Reliability (5 items):** Evaluates the ability to deliver promised services dependably and accurately (e.g., "The organization delivers its services as promised").
- **Empathy (5 items):** Measures the provision of caring and individualized attention to customers (e.g., "Employees give customers personal attention").

Each item was also rated on a 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree").

The questionnaires were distributed both online and in person to ensure a broad and representative sample. Ethical approval for the study was obtained from the relevant Libyan authorities, and all participants were informed about the purpose of the study and provided consent before participation.

Research Model

The research model for this study posits that the various dimensions of Green Human Resources Management (GHRM)—namely, Green Job Design, Green Recruitment and Selection, Green Training and Development, Green Performance Management, Green Compensation Management, Green Occupational Health and Safety, and Green Employee Relations—have a direct impact on the overall Service Quality, which is represented by the dimensions of Physical Attributes, Assurance, Responsiveness, Reliability, and Empathy. The model hypothesizes that effective implementation of GHRM practices leads to improved service quality in Libyan SMEs.

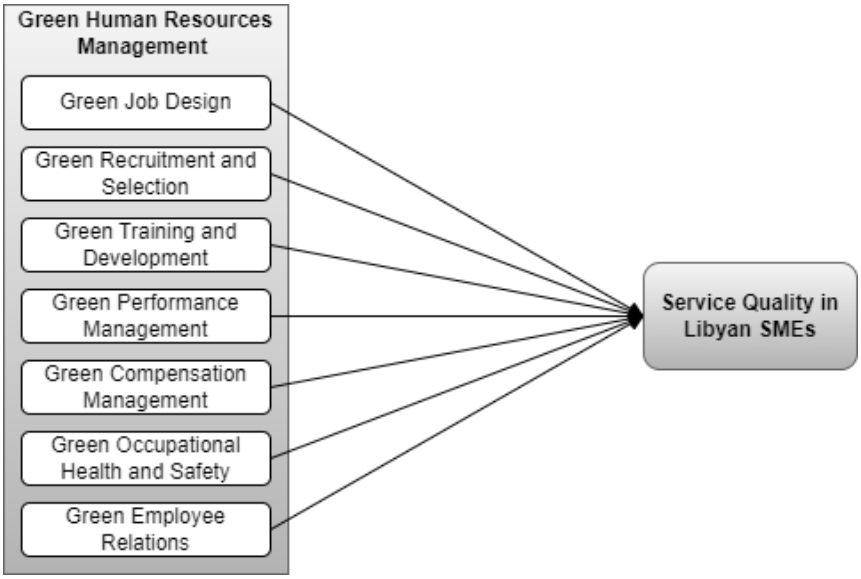

Figure 1. Model of the study

Research Hypotheses

The hypotheses formulated in this study are derived from the research objectives and the theoretical framework that underpins the relationship between Green Human Resources Management (GHRM) practices and service quality in Libyan SMEs. The research objectives focus on identifying the specific dimensions of GHRM practices that influence service quality and evaluating their significance. Accordingly, the hypotheses aim to test whether each dimension of GHRM has a positive and significant impact on service quality to address the research objectives comprehensively. This approach ensures that the hypotheses align with the study's goals while maintaining theoretical and empirical relevance. Based on the research model, the following hypotheses were formulated:

- **H1:** The green job design dimension of green human resources management practices has a positive and significant impact on service quality in Libyan SMEs.
- **H2:** The green recruitment and selection dimension of green human resources management practices has a positive and significant impact on service quality in Libyan SMEs.
- **H3:** The green training and development dimension of green human resources management practices has a positive and significant impact on service quality in Libyan SMEs.
- **H4:** The green performance management dimension of green human resources management practices has a positive and significant impact on service quality in Libyan SMEs.
- **H5:** The green compensation management dimension of green human resources management practices has a positive and significant impact on service quality in Libyan SMEs.
- **H6:** The green occupational health and safety dimension of green human resources management practices has a positive and significant impact on service quality in Libyan SMEs.
- **H7:** The green employee relations dimension of green human resources management practices has a positive and significant impact on service quality in Libyan SMEs.

Data Analysis Methods

The collected data were analyzed using the SPSS software. Descriptive statistics were used to measure the mean scores and standard deviations for each variable. Reliability analysis was conducted using Cronbach's alpha to help determine whether a collection of items consistently measures the same characteristic.

Multiple regression analysis was performed to test the hypotheses and determine the relationship between green human resources management (GHRM) and service quality. Before conducting the regression analysis, the assumptions of normality, linearity, and homoscedasticity were verified. Pearson correlation analysis was also employed to examine the relationships between the independent and dependent variables.

Additionally, factor analysis was carried out to confirm the validity of the measurement model and to identify the underlying factor structure of the GHRM and service quality scales. Exploratory factor analysis (EFA) was conducted initially, followed by confirmatory factor analysis (CFA) to validate the constructs used in the study. The results will be presented in the findings and discussion part.

Table 1: Skewness and Kurtosis Values

Variable	n	Skewness	Kurtosis
Green Job Design	100	0.324	-0.982
Green Recruitment and Selection	100	0.398	-0.754
Green Training and Development	100	0.217	-0.862
Green Performance Management	100	0.489	-0.693
Green Compensation Management	100	0.792	-0.321
Green Occupational Health and Safety	100	0.447	-0.832
Green Employee Relations	100	0.558	-0.783
Green Human Resources Management	100	0.473	-0.692
Physical Attributes	100	-0.172	-0.972
Assurance	100	-0.298	-0.803
Responsiveness	100	-0.137	-0.873
Reliability	100	-0.267	-0.789
Empathy	100	0.061	-1.032
Service Quality	100	-0.138	-0.798

Upon reviewing the values, it is evident that the skewness and kurtosis coefficients for each variable fall within the acceptable range of -3 to +3 (Kline, 2011). This indicates that the data distribution approximates normality. Consequently, parametric test techniques were employed in the study. To test the research hypotheses, normality, reliability, correlation, exploratory factor analysis, and multiple regression analyses were conducted. The relationship between green

human resources management and service quality was analyzed using the Pearson correlation coefficient, while the impact of green human resources management on service quality was assessed through multiple linear regression analysis.

FINDINGS AND DISCUSSION

In this section, the analyses conducted to test the research hypotheses are examined. The tests included normality, reliability, correlation, exploratory factor analysis, and multiple regression analysis. The data collected for the research were analyzed using SPSS 24.0, while Confirmatory Factor Analysis (CFA) was performed using AMOS 21.0 to examine the factor structures.

Reliability Analysis

Cronbach's Alpha is used in this study as a measure of internal consistency reliability to assess the interrelatedness of items within each scale. It evaluates whether the items in a construct consistently measure the same underlying concept, making it suitable for determining the reliability of the scales employed in this research (Tavakol & Dennick, 2011). Table 2 presents the reliability analysis using Cronbach's alpha values for each of the scales used:

Table 2: The reliability analysis using Cronbach's Alpha

Variable	Items	Cronbach's Alpha
Green Job Design	4	0.921
Green Recruitment and Selection	3	0.909
Green Training and Development	4	0.902
Green Performance Management	4	0.935
Green Compensation Management	5	0.948
Green Occupational Health and Safety	3	0.933
Green Employee Relations	3	0.951
Green Human Resources Management (Total)	26	0.976
Physical Attributes	2	0.836
Assurance	7	0.925
Responsiveness	4	0.880
Reliability	5	0.926
Empathy	4	0.894
Service Quality (Total)	22	0.966

According to Cronbach's alpha coefficient, the reliability of the scales ranges between 0 and 1. Based on Nunnally's (1967) criteria, a scale is considered unreliable if its alpha is below 0.40, has low reliability if between 0.40 and 0.60, is quite reliable if between 0.60 and 0.80, and is highly reliable if above 0.80. In this study, all scales and sub-dimensions exhibit high reliability (Cronbach's Alpha > 0.800).

Confirmatory Factor Analysis (CFA)

In this study, Confirmatory Factor Analysis (CFA) was performed using AMOS 21.0 to evaluate the factor structures of the measurement models. The results of the analyses are presented in the following tables.

Table 3: Goodness-of-Fit Values for the Green Human Resources Management Measurement Model

Index	Good Fit	Acceptable Fit	CFA Values
X^2	x	x	725.812
df	x	x	275
X^2/df	≤ 3	≤ 5	2.639
RMR	≤ 0.05	≤ 0.08	0.061
GFI	≥ 0.95	≥ 0.90	0.894
AGFI	≥ 0.90	≥ 0.85	0.861
NFI	≥ 0.95	≥ 0.90	0.937
TLI	≥ 0.95	≥ 0.90	0.950
CFI	≥ 0.97	≥ 0.90	0.959
RMSEA	≤ 0.05	≤ 0.08	0.068

The CFA results for the Green Human Resources Management (GHRM) scale indicate that most of the indices fall within the acceptable fit range (GFI is close to the acceptable threshold). This suggests that the data is compatible with the GHRM scale. The model structure with 7 sub-dimensions and 26 items was confirmed.

Table 4: Goodness-of-Fit Values for the Service Quality Measurement Model

Index	Good Fit	Acceptable Fit	CFA Values
X^2	x	x	678.459
df	x	x	195
X^2/df	≤ 3	≤ 5	3.478

RMR	≤ 0.05	≤ 0.08	0.028
GFI	≥ 0.95	≥ 0.90	0.905
AGFI	≥ 0.90	≥ 0.85	0.879
NFI	≥ 0.95	≥ 0.90	0.912
TLI	≥ 0.95	≥ 0.90	0.925
CFI	≥ 0.97	≥ 0.90	0.940
RMSEA	≤ 0.05	≤ 0.08	0.065

The CFA results for the Service Quality scale show that the indices are within acceptable limits. The data is compatible with the Service Quality scale, confirming the model structure with 5 dimensions and 22 items.

Table 5: Regression Analysis

Model	Independent Variable	Beta	t	p	R^2	F
1	Green Human Resources Management	0.493	10.432	0.000	0.245	115.673*
2	Green Job Design	0.205	2.610	0.010	0.305	21.451*
	Green Recruitment and Selection	-0.041	-0.354	0.724		
	Green Training and Development	0.219	2.432	0.016		
	Green Performance Management	-0.084	-0.823	0.412		
	Green Compensation Management	-0.026	-0.264	0.792		
	Green Occupational Health and Safety	0.471	4.523	0.000		
	Green Employee Relations	-0.174	-1.574	0.118		

Dependent Variable: Service Quality, *p < 0.05

In this study, service quality is treated as a composite construct representing an overall evaluation rather than being analyzed through its individual dimensions. This approach aligns with prior research that conceptualizes service quality as a higher-order latent variable, integrating multiple dimensions into a unified framework (Parasuraman, Zeithaml, & Berry, 1988). Small and medium-sized enterprises (SMEs) often assess service quality as a general measure to evaluate overall customer satisfaction and organizational performance rather than dissecting it into specific dimensions (Cronin & Taylor, 1992). Hence, this study reflects real-world business practices where managers focus on aggregate service quality outcomes. Many

studies examining the impact of organizational practices, such as green human resource management (GHRM), on service quality have opted for global measures rather than domain-specific ones (Ren, Tang, & Jackson, 2018). This allows for a clearer assessment of the general effect of GHRM practices without over-complicating the analysis.

Treating service quality as a single dependent variable simplifies the analytical process, reduces multicollinearity issues, and prevents inflation of Type I errors that may arise when testing multiple dependent variables simultaneously (Hair, Black, Babin, & Anderson, 2019). The primary objective of this study is to evaluate how various dimensions of GHRM practices collectively influence perceptions of service quality rather than isolating effects on specific service quality components. This approach is particularly relevant when seeking to provide strategic recommendations for SMEs where improvements in service quality are targeted holistically. Empirical evidence suggests that the sub-dimensions of service quality are interrelated and often load onto a single factor representing overall service quality (Grönroos, 2007). Therefore, combining these dimensions into a unified construct ensures the validity and reliability of the measurement model.

Model 1 Analysis

Model 1 examines the relationship between Green Human Resources Management (GHRM) and service quality in Libyan SMEs. The regression results indicate a moderate relationship between GHRM and service quality with $R = 0.493$, suggesting a statistically significant association between these variables. The R^2 value of 0.245 implies that 24.5% of the variance in service quality is explained by GHRM practices, and the adjusted $R^2 = 0.242$ supports this explanatory power after adjusting for the number of predictors.

The F-statistic ($F = 115.673$, $p < 0.001$) confirms the overall significance of the model, indicating that the predictors included in the model collectively explain variations in service quality. The standardized coefficient ($\beta = 0.493$, $p < 0.001$) further highlights the strength of this relationship. Specifically, a one-unit increase in GHRM practices is associated with a 0.493-unit increase in service quality.

However, it is important to clarify that this analysis reflects a statistical association rather than a causal relationship. While the results support the hypothesis that GHRM practices are positively correlated with service quality, causation cannot be definitively established without experimental or longitudinal designs.

Model 2 Analysis

Model 2 investigates the effects of specific dimensions of Green HR practices on service quality. The R^2 value of 0.305 suggests that the predictors collectively explain 30.5% of the variance in service quality, while the adjusted R^2 of 0.290 accounts for potential overfitting,

providing a more generalizable estimate. The F-statistic ($F = 21.451$, $p < 0.001$) indicates that the model is statistically significant.

Analyzing individual predictors reveals that only Green Job Design ($\beta = 0.205$, $p = 0.010$), Green Training and Development ($\beta = 0.219$, $p = 0.016$), and Green Occupational Health and Safety ($\beta = 0.471$, $p < 0.001$) show statistically significant relationships with service quality. These findings imply that increasing efforts in these areas of GHRM practices is associated with improvements in service quality.

In contrast, Green Recruitment and Selection ($\beta = -0.041$, $p = 0.724$), Green Performance Management ($\beta = -0.084$, $p = 0.412$), Green Compensation Management ($\beta = -0.026$, $p = 0.792$), and Green Employee Relations ($\beta = -0.174$, $p = 0.118$) do not exhibit statistically significant relationships with service quality. These dimensions may require further investigation, as their lack of significance could result from sample characteristics, measurement limitations, or contextual factors specific to Libyan SMEs.

The results demonstrate **statistically significant associations** between **specific GHRM practices** and **service quality** rather than definitive **causal effects**. The relationships observed can be attributed to theoretical frameworks that emphasize how **sustainable HR practices** influence employee behavior, organizational performance, and service delivery (Ren et al., 2018).

While the findings highlight strong **correlations**, they should be interpreted cautiously, as causality cannot be inferred based solely on cross-sectional data. Further research using **longitudinal methods** or **experimental designs** could help establish **causal links** between these variables.

Hypotheses Testing Results

Based on the analysis:

- **H1 (Green Job Design)**, **H3 (Green Training and Development)**, and **H6 (Green Occupational Health and Safety)** are **supported** as they show **significant positive relationships** with service quality.
- **H2 (Green Recruitment and Selection)**, **H4 (Green Performance Management)**, **H5 (Green Compensation Management)**, and **H7 (Green Employee Relations)** are **not supported**, as they lack **statistical significance**.

Practical Implications

The findings suggest that businesses should prioritize investments in **Green Job Design**, **Green Training and Development**, and **Green Occupational Health and Safety** to enhance

service quality. These practices likely improve employee skills, organizational sustainability, and workplace safety, contributing to better service outcomes.

For dimensions that did not show significant relationships, companies may need to re-evaluate implementation strategies or tailor these practices to better align with organizational goals and employee needs.

Discussion

The findings of this study highlight that Green Human Resources Management (GHRM) practices, specifically green job design, green training and development, and green occupational health and safety, exhibit significant and positive associations with service quality in small and medium-sized enterprises (SMEs) in Tripoli, Libya. These results underscore the importance of embedding sustainability principles within HRM practices to improve organizational performance and service delivery.

Green Job Design and Service Quality

The results demonstrate that green job design has a significant positive effect on service quality ($\beta = 0.205$, $p = 0.010$). This finding aligns with Jabbour et al. (2010), who emphasize that integrating environmental responsibilities into job descriptions increases employee motivation and performance. Similarly, Renwick et al. (2013) found that clearly defined green roles enhance employee accountability, leading to improvements in service delivery.

This relationship can be explained through the lens of role clarity theory, where employees with well-defined green job roles feel empowered and engaged in their tasks, fostering commitment to service excellence. In the Libyan context, this effect may also reflect the growing awareness of environmental sustainability and the adoption of green practices to improve service quality in SMEs.

Green Training and Development and Service Quality

The study finds a significant positive effect of green training and development on service quality ($\beta = 0.219$, $p = 0.016$). This result is consistent with Ahmad (2015) and Dumont, Shen, and Deng (2017), who report that green training programs enhance employees' environmental awareness and skillsets, enabling them to implement sustainable practices effectively.

These findings align with human capital theory, which suggests that training programs improve employee competencies, translating into higher service quality. In Libya, this relationship highlights the importance of capacity building to foster eco-friendly behaviors, especially in SMEs, where green awareness is still emerging.

Green Occupational Health and Safety and Service Quality

The strongest positive relationship in the study was observed between green occupational health and safety and service quality ($\beta = 0.471$, $p < 0.001$). This finding supports Longoni, Golini, and Cagliano (2014), who emphasize that organizations prioritizing employee safety and environmental responsibility tend to create better working environments and deliver higher-quality services.

This relationship may be attributed to the fact that safe and healthy workplaces lead to higher employee morale, productivity, and loyalty, which, in turn, reflect positively on service delivery. For Libyan SMEs, focusing on green safety practices can be particularly impactful, given the limited resources and the need to create efficient and sustainable systems.

Non-significant Effects of Other GHRM Practices

Contrary to expectations, the study found that green recruitment and selection, green performance management, green compensation management, and green employee relations did not exhibit significant effects on service quality.

This result may be explained by the early adoption phase of GHRM practices in Libya, where SMEs are still developing their frameworks and focusing on basic implementation rather than strategic integration. Studies like Jackson et al. (2011) and Zibarras and Coan (2015) highlight that comprehensive GHRM strategies require mature organizational structures, which may still be lacking in the Libyan context.

Furthermore, the non-significant effects may reflect the context-specific challenges faced by SMEs in Libya, including resource constraints, limited awareness, and the absence of regulatory frameworks supporting sustainability practices.

Implications for SMEs in Libya

The findings suggest that Libyan SMEs can significantly enhance service quality by focusing on green job design, training, and occupational health and safety. These practices are practical and impactful steps toward sustainability and competitiveness in markets increasingly driven by environmental concerns.

As the study does not provide direct causal evidence of implementation success across all domains. Instead, the findings are based on statistical associations that reflect potential linkages rather than causation. Future studies could adopt longitudinal designs or case studies to validate these effects in real-world applications.

Comparative Insights

Compared to studies conducted in other regions, such as Tang et al. (2018) in China and Yusliza, Ramayah, and Othman (2015) in Malaysia, the findings emphasize the importance of a context-specific approach to GHRM implementation.

While universal benefits of GHRM practices have been observed globally, this study reveals that their effectiveness in Libya depends on the local business environment, regulatory structures, and the maturity of adoption. For example, Libyan SMEs may need to focus on foundational practices like job design, training, and safety before expanding to more complex areas of GHRM, such as compensation systems or employee relations.

This highlights that while external contexts may share broad similarities in terms of economic challenges and sustainability goals, the specific dynamics in Libya require a phased adoption strategy tailored to its unique socio-economic conditions.

CONCLUSION

This study was conducted to determine the effects of Green Human Resources Management (GHRM) on service quality, based on the participation of employees working in small and medium-sized enterprises (SMEs) located in Tripoli, Libya. The study holds significance as there is limited research on GHRM in the context of Libyan SMEs, particularly regarding its impact on service quality. Participants were asked 26 questions covering the sub-dimensions of GHRM, including green job design, green recruitment and selection, green training and development, green performance management, green compensation management, green occupational health and safety, and green employee relations. Additionally, 22 questions were posed to assess the sub-dimensions of service quality, namely physical attributes, assurance, responsiveness, reliability, and empathy.

The findings revealed that some GHRM practices, such as green employee relations, green recruitment and selection, green performance management, and green compensation management, do not have a significant impact on service quality. However, it was observed that green job design, green training and development, and green occupational health and safety have a significant and positive effect on service quality. It is crucial for SMEs offering service-related activities to adopt a management approach that prevents employees from losing motivation and trust in their work. Meeting the expectations of both employees and customers is only possible through an effective management and quality system.

With the increasing competition and globalization in today's world, environmental awareness has gained more importance, leading to the emergence of sustainable practices such as Green Human Resources Management. The study results indicate that employees in Libyan SMEs are not yet fully informed about the concept of GHRM. To contribute to sustainability, it is essential to integrate GHRM practices into existing human resources management, rather than

solely relying on traditional HRM practices. Moreover, improving employee motivation through GHRM practices can yield positive results in terms of service quality.

Firstly, developing the green recruitment process can make employees more environmentally conscious in both their personal and professional lives, which will facilitate effective management of processes, especially in extraordinary situations. Providing green training to employees can raise their awareness and knowledge about environmental sustainability. As there is still limited research in the Libyan context regarding the impact of GHRM on service quality, it is hoped that this study will contribute to the literature. Future studies could expand the scope by exploring other service sectors, thereby broadening the topic and its implications.

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