

A Review on the Importance of E-Commerce Adoption in Sme's of Pakistan

Mr. Ali Abbas ¹, Dr. Sahadah Haji Abdullah² Dr. Rosli Mohd Saad³

¹⁻³University Utara Malaysia (UUM)

ABSTRACT - *E-commerce adoption becomes important factor of success for both large firms and Small and Medium Enterprises (SMEs) as it helps to reduce transaction cost, approach larger untapped markets and avoid intermediaries. However, the published research has mainly focused on the role of e-commerce adoption in large organizations compared with SMEs. Given the lack of scholarly discussion on the importance of e-commerce adoption in SMEs especially in Pakistan, the present paper explored the comprehensive review of the past literature to enhance the understanding of the problem. The research finding highlights the importance of e-commerce adoption in the SMEs in developing countries and its potential role in the SMEs in Pakistan.*

Key words: E-Commerce adoption; SMEs; Developing countries; Pakistan

1. MOTIVATION OF STUDY

E-commerce adoption refers to “the buying and selling of information, products, and services via computer networks”(Kalakota&Whinston, 1997). IT is transforming the way business is done traditionally and transactions are carried out between trading parties. Scholars believe that e-commerce adoption has tremendous potential to contribute in economic growth more so for developing countries than the developed ones(Lituchy& Rail, 2000);(Kshetri, 2001). It may be because there is a more room for improvement in the developing countries, owing to larger population and huge untapped markets dispersed on a wide geographic area. Research indicates that e-commerce adoptions not only one of the most important tools for large companies, but is also imperative for small medium enterprises (SMEs) to progress and sustain. According to(Molla& Licker, 2005)e-commerce adoption helps SMEs not only to reduce transaction cost but also helps to get rid of intermediaries gives more convenience of selection from a range of products and services available on storefronts.However, many researches have been conducted on the use of e-commerce; if there is more need for scientific efforts on

the role of e-commerce in SMEs in developing countries. Hence, we have conducted a comprehensive review of the published literature on the importance of e-commerce adoption for SMEs in the developing countries; especially in Pakistani context since majority of previous scholars have mainly focused on the developed regions where socio-cultural, economic, political and technological factors differ greatly from those in the developing regions. Even the same economic development level and the region does not imply that the studies can be generalized because of various country specific factors, such as form of government economic conditions and other factors. The present effort therefore contributes to better understand the test among e-commerce adoption and SMEs in the developing country and indicate the potential avenues for adopting-commerce adoption in SMEs of Pakistan to grow and sustain. We discuss the importance of SMEs in Pakistan, and a brief discussion on potential role of e-commerce adoption in the next section.

2. LITRATURE REVIEW

2.1. E-Commerce Adoption:

Pakistan is developing country in South Asia and have a population of 200 million people. With agriculture-based economy in the former, has invested a lot in the last two decades the industrial base in the country. It can only collect necessary for the country to deal with the digital world means that in the new century (Eden, 2016). Recently, the government has developed effective policies to promote digital opportunities. Measures include a digital opportunity: foreign investment in the IT sector to attract (Oswald, Huber, Wilson, &Embree, 2015). Create a virtual university centers and information technology brought new technology-based infrastructure promotes to enhance digital opportunities to accelerate a number Communication Technology (ICT) Information and business and industry growth by fostering education through global certification programs and other core initiatives create a greenhouse-driven development combined with the maintenance of economic measures. Digital Opportunity Initiative (DOI) removing the geographical boundaries of their speed, just the size, and the address of the new realities of the use of information

and communication technologies with the ability to connect to a vast network of people at low cost putting a compendium.

SMEs work as growth engines for a country's economy (Poon & Swatman, 1999). SMEs make up approximately 80% of world economic growth. Despite such importance of e-commerce adoption and SMEs and extensive studies on subject; unfortunately there has not been a single standard definition among researchers for the two terms. Different researchers describe them in a different way; For instance, (Simpson & Docherty, 2004); (Cloete, Courtney, & Fintz, 2002); (MacGregor & Vrazalic, 2004); and (Chitura, Mupemhi, Dube, & Bolongkikit, 2008). SMEs are business enters employing a maximum of 250 full time employees. It is agreed among researchers that e-commerce adoption and ICTs can benefit organizations in general.

It has been made possible through the improvement of telecommunications infrastructure. Pakistan get access to the Internet, where 1.3 million user access to the Internet worldwide, where the cost of Internet bandwidth for software companies, educational institutions and call-centers have been dramatically reduced to 400 cities in the country (Mujahid, 2002). Pakistan plans to achieve the end of 2020 300 million bits (Mbits) of the Internet backbone bandwidth (Mujahid, 2002). Pakistan Telecommunication Company Limited (PTCL), a leader in Internet connection and 90% of digitizing systems in major cities to provide services, fiber optic cable backbone systems, and digital radio with their own people, Satellite changed a network of contacts and exchanges international gateway. PTCL is an Internet Service Provider (ISP) to provide an infrastructure provider connection, data network operators, software exporters, educational institutions, universities and corporate clients. PTCL Internet service provider (ISP) in Pakistan and data network operator, exporting computer software and educational institutions, universities and corporate infrastructure to connect with customers.

The Government of Pakistan believes that information and communication technologies can contribute to income generation and poverty reduction. Allowing individuals and businesses to increase productivity, promote economic activity and network participation, and create more jobs and businesses take full advantage of economic opportunities. When the use of information and communication technology, companies can reduce marketing and promotion and marginalize the cost of operations by reducing procurement and transaction costs of materials and reduce the cost of intermediate products and finished products. With the World Wide Web (WWW) appears, ICT is creating new ways to offer

products to buyers and sellers together and provide a competitive edge for businesses. Small and medium-sized enterprises have access to the potential advantages of information and communication technology development in Pakistan. In Pakistan, 90% of private sector enterprises are small and medium-sized, providing 80% of the industrial labor force, contributing 40% to GDP of Pakistan. SME Development Agency (SMEDA 2015) has been established to develop as a core policy. The emergence of the World Wide Web (WWW), ICT realizing new ways to provide products and brings buyers and sellers together and provide competitive advantages in trade. a small and simple organization in Pakistan should benefit from the potential and the information and communication technologies. In Pakistan, 90% of all the commercial private sector ICT included in the category of PKS, it also offers 80% instead of state industrial work and contribute to 40% of its KDNK. Simple Small Business Development and Organization (SMEDA 2015) has been established as a basis for SMEs. E-marketing business opportunities today SMEDA is the most comprehensive and exports. Most SMEs in Pakistan involved in the production of export goods. These SMEs account for 30% of total export receipts.

The main objective of this project is to improve the knowledge to develop a B2B portal for the needs of small and medium-sized enterprises in various industries in the country. It involves a web-based sustainable development projects, designed to be the biggest source of information generation, exchange and dissemination by providing value-added support services to SMEs, as well as in Pakistan in, which is an initiative of ECA, contribute to the overall economy of Pakistan ECA. This effect is expected to rise to US \$ 2 billion. At present, SMEs in Pakistan face the same problems will spread slowly. Knowing the size of the domestic market, business in Pakistan seems to have agreed to use technology internet business. ECA promises many benefits ranging from lower costs for better communication. Because of these advantages, the EC has been extensively studied. The study of the current literature on the use of technology reveals that most of the early writers were mainly the traditional use of the system IS retrieval system, satisfaction, and success in the implementation. However, the overwhelming dependence of business on the Internet technology has shifted the paradigm of the study used solely for the EC. Authors, (Gandhi, 2016), (Widjaja, 2015) and (Chaffey, 2015) have investigated that ECA authors investigate business organizations.. Once again, very few authors like (Poon

&Swatman, 1999), (Jeffcoate, Chappell, &Feindt, 2002),(Lefebvre, Lefebvre, Elia, &Boeck, 2005; Quayle, 2002) have focused on ECA in SMEs,

As mentioned above, most of these studies have been done on the adoption of the EC in Western countries. There is little research on the Asia-Pacific region and beyond can be divided into two subgroups. SMEs in China accounted for 60% of GDP growth in the country in 2013 and formed 99.5% of all companies across the country. 1.58 million SMEs registered in China in the first half of 2014 alone. SMEs are not something to be ignored. Some researchers have studied the use of IT in SMEs(Fink et al., 1998);(Phau&Meng Poon, 2000). Other authors, such as (Poon &Swatman, 1999) and (Chong & Bauer, 2000)have investigated various organizations, innovation and environmental factors that have contributed to the adoption of a small company.

3. IMPORTANCE OF SME'S IN PAKISTAN:

Small and Medium Enterprises Development Authority (SMEDA) was formed in 1998 is the premier institution of the Government of Pakistan for policy formulation to better develop SMEs, it works under the ministry of Industries. SMEDA defines, SMEs as business units having full time employees up to 250, annual sales up to PKR 250 Million (USD 2.5 Million approx.) and paid up capital up to PKR 25 Million (USD 0.25 Million approx.). SMEDA's eservices/IIN provides various E-marketing services to SMEs using several digital technologies that link E-marketing with technical and innovative aspects of the internet, using Search Engine Marketing (SEM) and Search Engine Optimization (SEO) along with email marketing and web technology 2.0 strategies. Web technologies 2.0 are widely used by e-commerce adoption, as they focus on user-generated content; it allows users to interact with each other like a social media. Further, it enables customers to give feedback about the product or services offered on e-commerce adoption or ask for opinions and share their purchase experiences with others on the site. Most of the Small and medium-sized companies in Pakistan involved in the production of exportable goods. Small and medium-sized companies produce 30% of the total export earnings.

SME sector in Pakistan is pivotal for economic growth, contributes greatly in employment generation, poverty alleviation. SMEs account for over 90% of all SMEs in the country and there are approximately 3.2 Million SME units in Pakistan. SMEs in Pakistan contribute 40% to GDP (SMEDA, 2016)and an estimated 80% labor force other than agriculture is employed by manufacturing sector(Labor force survey 2015-20) and the same also has 25% share in the exports.During the period (2003-2015)

world exports grew at 14% per annum while Pakistan's growth during the same period had been just 11%. Whereas, the annual export growth of our neighbor countries was more than 3 times that of India and China showed remarkable export growth rate of 39% & 37% respectively. One of the reasons being exposure to world market through their well-established e-commerce channels.

Moreover, SMEDA's next 5 year plan estimates and boost to economy by CPEC exponential growth in emerging and traditional SMEs selected on the basis of their potential to generate employment, contribute to GDP, no of SME's and enhance exports, (Mubarik, Govindaraju, &Devadason, 2016)(Faizan, 2016)as presented in Table: 1

Table 1: SMEs and the Economy of Pakistan

Indicators Change	2015*	2020	Incremental Change
Employment	14.931 Million	Above 25.00 Million	10.069 million
GDP	40%	Above 50%	10%
No. of Enterprises	3.2 Million	Above 4 Million	0.8 million
Exports	25%	Above 54.20 %	29.2%

4. E-COMMERCE ADOPTION IN THE SUBJECT OF PAKISTAN, OTHER COUNTRIES IN THE REGION:

Currently, Pakistan lags far behind in terms of e-commerce adoption infrastructure and business volume compared to the other countries in the region, such as China, India, Turkey and others. The current statistics report that e-commerce adoption is really thriving in the immediate region of Pakistan, For instance: Alibaba.com Group of China set a world record when it got listed at the NYSE (New York Stock Exchange) in September, 2014 raising huge Initial Public Offering (IPO) of \$ 25 Billion, making it the biggest IPO in the world, taking lead from Wal-Mart the world's largest old discount store chain. 3G boosted the internet usage in India and e-commerce adoption grew exponentially. In the region, Sri Lanka was the first one to launch 3G in 2006, followed by India in 2009 and recently Pakistan joined the 3G club in 2014 (Cooper & Momani, 2014). Although Pakistan is late to the party but still has immense potential and huge increase in internet penetration rate is estimated. According to one estimate, Pakistan's Internet users' number is estimated to increase from 30 Million users 2015 to 56 Million in 2020 (Ahmed, Vveinhardt, & Nawaz, 2016). Whereas, the online purchases in Pakistan stand at \$ 30 Million annually which is expected to grow multiple times and reach \$ 200 Million by 2020. e-commerce adoption reduced cost of the transaction, the global supply chain to the intermediaries and facilitating Internet to eliminate interaction technology and ICT capacity due to SMEs development in developing countries Provide facility (Jorgenson & Vu, 2016; Molla & Licker, 2005) To admit the significance of E-Commerce, over 20% of SMEs in Pakistan implemented it in their business to take competitive advantage not only locally but also in international market (Khan, Liang, & Shahzad, 2014). Electronic Supply Chain Management applications in SMEs enable them cut operation cost, provide better customer service, better inventory management, reduce order cycle, receive customer feedback, maintain customer profiling, hence can satisfy customers better and achieve an overall competitive edge (Chuang & Shaw, 2000).

Country is witnessing online brands allocate sufficient advertising budgets for TV commercials, Newspapers in addition to advertising on social media. Several foreign companies have already entered Pakistan to cash on the highly potential-commerce adoption market. For Instance: Rocket Internet a German internet company which is running tow e-commerce adoption sites in Pakistan

namely Daraz.pk and Kaymu.pk recently raised a huge \$8.2 Billion IPO in October, 2015. And the two will be bringing huge capital into e-commerce adoption market not witnessed in the country before. Many other local online companies are also expected to follow the trend. On the other hand there over 650,000 SMEs presently registered at the world's biggest Business-to-Business giant, Alibaba.com group and this number is expected grow rapidly. This growing industry will gain more credibility; as a result consumer trust in e-commerce adoption will spread through word of mouth.

Electronic payment systems are also growing rapidly in Pakistan which means that in future there will be huge potential of e-commerce adoption websites (Shrier, Canale, Pentland, 2016). Currently due to lack online payment systems over 95% of online purchases are completed through Cash on Delivery (COD), which is not one of the most preferred and convenient payment method. Well-developed electronic payment system is indispensable for the growth and sustainability of e-commerce. Multiple payment options encourage more online shopping as customers feel ease and convenience (Yoo, Kim, & Sanders, 2015). In China for example, e-commerce adoption is of enormous volume and there are various payment options available to customers. Such as, online bank payment, debit card payment, credit card payment powered by Union Pay, COD, and We Chat etc. TCS, BlueEX, Leopards, OCS, and other couriers are providing COD services across over 150 cities of Pakistan. The data indicates a very lucrative avenue to the businesses revealing that over 1/3 of the orders are from cities other than 3 major cities of Pakistan. In major cities more people buy online, however, the value for shoppers living outside major cities is higher as many products they can't find in the markets nearby (Mars et al., 2015). Hence, this large untapped market segment will changeover to shopping online (Narang & Trivedi, 2016).

SMEs in Pakistan have the largest e-commerce adoption platform to marketing of their products globally through Alibaba.com, as the Pearl Shine Group International (PSGI), a Pakistan based firm has inked a planned partnership promise with the world's largest growing B2B platform as per the agreement, PSGI has been authorized to verify SMEs for registration at Alibaba.com's B2B portal, this will bring manufacturers in contact with suppliers for online trade globally.

More than 650,000 Pakistan SMEs Pakistan are current affiliates of Alibaba.com (Khan et al., 2014) and these SMEs Expand its business partnership agreement and it will give

the opportunity for more Pakistani SMEs to enjoy great visibility.

5. RESOURCE BASED VIEW AND E-COMMERCE ADOPTION:

(Dwivedi, Papazafeiropoulo, Parker, & Castleman, 2009) The granting of credit for the RBT because it highlights any source that small and medium-sized companies have, including material resources and non-material. A limit of RBT is that it should be the use of resources in small and medium enterprises at full capacity. It includes resources that have been identified in the owner managers of SMEs, and the characteristics of workers. (Caldeira & Ward, 2003). (Rivard, Raymond, & Verreault, 2006) pointed out that previous studies that represent the viewpoint of the contribution of resource-based e-commerce for the performance of small and medium enterprises that focus on the affiliation between resources and e-commerce itself and the performance of small companies and medium. Although RBT (Dwivedi et al., 2009) have emphasized thenegatively. In the study before interest, as evidenced by the previous discussion to explain the theory, the usage of the company, the use of information systems and technology in SMEs in the industry Portugal (Caldeira & Ward, 2003) resources based. This review is based on the strength of RBT to improve understanding of entrepreneurship in the SME environment.

6. CONCLUSION

The study found that the use of e-commerce to meet competitors and provide better service to customers and improve relationships with suppliers has produced approve small business to a large extent friends bigger. Only the area of improving the functioning of large companies did not show a greater interest in e-commerce. Therefore, it seems that e-commerce for small businesses can not actually see the opportunity to improve their performance, and therefore the same as in the game. For companies that are bigger, it would seem that e-commerce has been considered to be more defensive, especially as an opportunity to simplify the complicated internal processes and thereby reduce costs. Based on the above aspects and relevant debate, we can conclude that the use of e-commerce is a great potential for SMEs in Pakistan, in particular the development of SMEs export giant business-to-business world, Alibaba.com has allowed the company to stay SMEs Pakistan in the list on the website, will present the product to the world. SMEs have been involved in the generation of employment opportunities and reduce poverty, as above; in the future, this proportion is expected to increase. Since SMEs are companies with resources less than large companies so that they cannot reach the mass market and the share of the advertising and marketing budget, this is a major problem for SMEs can be addressed through most of

admission E-commerce, and this will allowing them to compete with their larger business rather fair competition. In the future, this study proposes to explore the importance of the relationship between the use of e-commerce and relevant sources such as the use of social media in the context of e-commerce for SMEs in Pakistan. As in previous studies, especially in quantitative, qualitative research topic is highly recommended to get a deep understanding of the subject and explore to exploit the invention.



Ali Abbas

7. REFERENCES

- [1] Ahmed, R. R., Vveinhardt, J., & Nawaz, A. (2016). *Empirical Analysis of Internet Usage and Academic Performance of Students: Evidence from Pakistan*. Paper presented at the Proceedings of EDULEARN16 Conference 4th-6th July.
- [2] Caldeira, M. M., & Ward, J. M. (2003). Using resource-based theory to interpret the successful adoption and use of information systems and technology in manufacturing small and medium-sized enterprises. *European journal of information systems*, 12(2), 127-141.
- [3] Chaffey, D. (2015). *Digital Business & E-Commerce Management: Strategy Implementation & Practice*: Pearson Education.
- [4] Chitura, T., Mupemhi, S., Dube, T., & Bolongkikit, J. (2008). Barriers to electronic commerce adoption in small and medium enterprises: A critical literature review. *Journal of Internet Banking and Commerce*, 13(2), 1.
- [5] Chong, S., & Bauer, C. (2000). A model of factor influences on Electronic Commerce adoption and diffusion in small-and medium-sized enterprises. *PACIS 2000 Proceedings*, 23.
- [6] Chuang, M.-L., & Shaw, W. H. (2000). *Distinguishing the critical success factors between e-commerce, enterprise resource planning, and supply chain management*. Paper presented at the Engineering Management Society, 2000. Proceedings of the 2000 IEEE.
- [7] Cloete, E., Courtney, S., & Fintz, J. (2002). Small businesses' acceptance and adoption of e-commerce in the Western Cape Province of South Africa. *EJISDC: The Electronic Journal on Information Systems in Developing Countries*(10), 3.

- [8] Cooper, A. F., & Momani, B. (2014). Re-balancing the G-20 from Efficiency to Legitimacy: The 3G Coalition and the Practice of Global Governance. *Global Governance: A Review of Multilateralism and International Organizations*, 20(2), 213-232.
- [9] Dwivedi, Y. K., Papazafeiropoulou, A., Parker, C. M., & Castleman, T. (2009). Small firm e-business adoption: a critical analysis of theory. *Journal of Enterprise Information Management*, 22(1/2), 167-182.
- [10] Eden, L. (2016). *Multinationals and Foreign Investment Policies in a Digital World*.
- [11] Faizan, N. Z. (2016). Quality Work-Life as Predictor to Organisational Commitment under Contrasting Leadership Styles: IT Responses from Pakistan's Private Software Houses. *Global Journal of Management And Business Research*, 16(6).
- [12] Fink, Y., Winn, J. N., Fan, S., Chen, C., Michel, J., Joannopoulos, J. D., & Thomas, E. L. (1998). Adielectric omnidirectional reflector. *Science*, 282(5394), 1679-1682.
- [13] Gandhi, S. K. (2016). India's Jumbo Jump from E-Commerce to Mobile Enabled Services (MES): A Review. *Productivity*, 56(4), 326.
- [14] Jeffcoate, J., Chappell, C., & Feindt, S. (2002). Best practice in SME adoption of e-commerce. *Benchmarking: An international journal*, 9(2), 122-132.
- [15] Jorgenson, D. W., & Vu, K. M. (2016). The ICT revolution, world economic growth, and policy issues. *Telecommunications Policy*, 40(5), 383-397.
- [16] Kalakota, R., & Whinston, A. B. (1997). *Electronic commerce: a manager's guide*: Addison-Wesley Professional.
- [17] Khan, S. A., Liang, Y., & Shahzad, S. (2014). Adoption of Electronic Supply Chain Management and E-Commerce by Small and Medium Enterprises and Their Performance: A Survey of SMEs in Pakistan. *American Journal of Industrial and Business Management*, 2014.
- [18] Kshetri, N. B. (2001). Determinants of the locus of global e-commerce. *Electronic Markets*, 11(4), 250-257.
- [19] Lefebvre, L.-A., Lefebvre, É., Elia, E., & Boeck, H. (2005). Exploring B-to-B e-commerce adoption trajectories in manufacturing SMEs. *Technovation*, 25(12), 1443-1456.
- [20] Lituchy, T. R., & Rail, A. (2000). Bed and breakfasts, small inns, and the Internet: The impact of technology on the globalization of small businesses. *Journal of International Marketing*, 8(2), 86-97.
- [21] MacGregor, R., & Vrazalic, L. (2004). Electronic commerce adoption in Small to Medium Enterprises (SMEs). *A Comparative study of SMEs in Wollongong (Australia) and Karlstad (Sweden)*, University of Wollongong.
- [22] Mars, S. G., Fessel, J. N., Bourgois, P., Montero, F., Karandinos, G., & Ciccarone, D. (2015). Heroin-related overdose: The unexplored influences of markets, marketing and source-types in the United States. *Social Science & Medicine*, 140, 44-53.
- [23] Molla, A., & Licker, P. S. (2005). Perceived e-readiness factors in e-commerce adoption: An empirical investigation in a developing country. *International Journal of Electronic Commerce*, 10(1), 83-110.
- [24] Mubarik, M. S., Govindaraju, C., & Devadason, E. S. (2016). Human capital development for SMEs in Pakistan: is the "one-size-fits-all" policy adequate? *International Journal of Social Economics*, 43(8), 804-822. Mujahid, Y. H. (2002). Digital opportunity initiative for Pakistan. *The Electronic Journal of Information Systems in Developing Countries*, 8.
- [25] Narang, R., & Trivedi, P. (2016). Challenges and Opportunities of E-Tailing in Emerging Economies. *E-Retailing Challenges and Opportunities in the Global Marketplace*, 50.
- [26] Oswald, G. R., Huber, M. J., Wilson, J. F., & Embree, J. (2015). The Status of Technology-Enhanced Education and Service Delivery in Rehabilitation Counselor Education. *Rehabilitation Research, Policy, and Education*, 29(3), 194-207.
- [27] Phau, I., & Meng Poon, S. (2000). Factors influencing the types of products and services purchased over the Internet. *Internet Research*, 10(2), 102-113.
- [28] Poon, S., & Swatman, P. M. (1999). An exploratory study of small business Internet commerce issues. *Information & Management*, 35(1), 9-18.
- [29] Quayle, M. (2002). E-commerce: the challenge for UK SMEs in the twenty-first century. *International Journal of Operations & Production Management*, 22(10), 1148-1161.
- [30] Rivard, S., Raymond, L., & Verreault, D. (2006). Resource-based view and competitive strategy: An integrated model of the contribution of information

technology to firm performance. *The Journal of Strategic Information Systems*, 15(1), 29-50.

[31] Shrier, D., Canale, G., & Pentland, A. (2016). Mobile Money & Payments: Technology Trends.

[32] Simpson, M., & Docherty, A. J. (2004). E-commerce adoption support and advice for UK SMEs. *Journal of small business and enterprise development*, 11(3), 315-328.

[33] SMEDA (Producer). (2016). home.smeda. Retrieved from http://www.smeda.org/index.php?option=com_content&view=article&id=7:state-of-smes-in-pakistan&catid=15

[34] Widjaja, H. A. E. (2015). *E-commerce implementation to support ornamental fish breeders in Indonesia*. Paper presented at the 2015 International Conference on Information Technology Systems and Innovation (ICITSI).

[35] Yoo, C. W., Kim, Y. J., & Sanders, G. L. (2015). The impact of interactivity of electronic word of mouth systems and E-Quality on decision support in the context of the e-marketplace. *Information & Management*, 52(4), 496-505.