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Conducive TLE Laboratory Environment and Learning Process Skills of the Students in Cluster 4 Schools in Davao City

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Abstract: Fundamentally, a conducive TLE laboratory environment was expected to improve the learning process skills of the students. In this study, the researcher selected 200 junior high school students in Cluster 4 Public Secondary Schools in Davao City as the respondents. Stratified random sampling technique was utilized in the selection of the respondents. A non-experimental quantitative research design using a descriptive-correlational method was employed. The data collected were subjected to the following statistical tools: Mean, Pearson Product Moment Correlation, and multiple linear regression analysis. Findings revealed that the conducive TLE laboratory environment and the learning process skills of the students were described as extensive. Further, correlation analysis demonstrated that there was a significant relationship between a conducive TLE laboratory environment and the learning process skills of the students. Evidently, regression analysis proved that a conducive TLE laboratory environment in terms of open-endedness, rule clarity, and material environment were significant predictors of the learning process skills of the students. In other words, a conducive TLE laboratory environment influenced the learning process skills of the students in Cluster 4 Public Secondary Schools in Davao City.

Keywords: Conducive TLE Laboratory Environment, Home Economics, Learning Process Skills

A. Introduction

In the United States, one significant challenge affecting the learning process skills of secondary school students is the disparity in educational resources and support. Schools in underfunded areas often lack access to advanced technology, experienced teachers, and enriching extracurricular programs, which are essential for developing critical thinking, problem-solving, and collaborative skills. These inequities contribute to a performance gap between students from different socio-economic backgrounds (Darling-Hammond et al., 2019). In Asia, Zhao (2020) noted that while students in these

countries often excel in standardized tests, they may struggle with creativity, critical thinking, and independent learning due to the intense focus on memorization and examination performance. In the Philippines, challenges include inadequate infrastructure, large class sizes, and a lack of trained teachers, all of which impede the effective teaching and learning of process skills. These factors result in students having limited access to interactive and student-centered learning experiences that are crucial for developing essential skills such as problem-solving, collaboration, and critical thinking (Reyes et al., 2019).

Despite extensive research on the impact of a conducive TLE (Technology and Livelihood Education) laboratory environment on students' learning process skills, most studies had been conducted in foreign settings, particularly in Western countries. These studies often focused on college students, leaving a significant gap in understanding how these environments influenced secondary school students, particularly in the Philippine context. Given the unique cultural, educational, and infrastructural conditions in the Philippines, it was crucial to investigate how TLE laboratory environments affected the learning process skills of Filipino secondary school students. This research aimed to fill this gap by providing localized insights that could inform educational policies and practices, ensuring that the benefits of a conducive TLE laboratory environment were fully realized for younger students in the Philippines. Understanding this relationship at the secondary school level was essential for developing effective strategies to enhance student engagement, critical thinking, and practical skills in a setting that had not been extensively studied before.

Recent studies have increasingly highlighted the importance of a conducive TLE (Technology and Livelihood Education) laboratory environment in enhancing the learning process skills of secondary school students. Research conducted by Alegre and Cebrian (2019) emphasized that well-equipped and supportive TLE environments significantly improve students' engagement, critical thinking, and practical skills. These environments provide hands-on learning opportunities, fostering skills that are crucial for both academic and vocational success. Additionally, Sia and Chua (2020) found that students in conducive TLE settings exhibited higher motivation and better performance in practical tasks compared to those in less supportive environments. However, most of these studies have been concentrated in Western contexts or at the college level, indicating a need for more localized research within secondary schools in the Philippines to fully understand and leverage the benefits of conducive TLE laboratory environments for younger students. This growing body of evidence underscores the need for educational institutions to prioritize and invest in the development of supportive TLE laboratories to enhance the overall learning experience and skill development of students.

The quantitative inquiry into the influence of a conducive TLE (Technology and Livelihood Education) laboratory environment on the learning process skills of secondary school students presents a novel approach by focusing on an underexplored demographic within a specific cultural context. Previous research has predominantly centered on college students in Western settings, leaving a gap in understanding how such environments affect younger learners, particularly in the Philippines. By employing quantitative methods, this study aims to provide empirical evidence on the direct correlation between TLE laboratory conditions and the development of critical thinking, problem-solving, and practical skills among secondary school students. This approach not only addresses the scarcity of localized studies but also contributes to the global discourse on educational environments by highlighting unique cultural and educational dynamics in the Philippines. According to Bernardo and Garcia (2021), investigating these variables through a quantitative lens can yield actionable insights that inform policy and educational practice, ultimately enhancing student outcomes.

The quantitative inquiry into the influence of a conducive TLE (Technology and Livelihood Education) laboratory environment on secondary school students' learning process skills significantly contributes to the educational field by providing empirical evidence that supports the importance of well-equipped learning spaces. This study highlights how specific elements of the laboratory environment, such as open-endedness, rule clarity, and material availability, directly enhance students' critical thinking, problem-solving, and practical skills. By focusing on secondary school students in the Philippine context, this research fills a crucial gap in existing literature and offers insights that are culturally and contextually relevant. Furthermore, the findings can inform policymakers and educators in designing and implementing strategies to create more effective learning environments, ultimately leading to improved educational outcomes for students.

The primary aim of this study was to determine which domains of a conducive learning environment best influenced the learning process skills of the learners in Cluster 4 Public Secondary Schools in Davao City. Specifically, this study sought to answer the following questions:

1. What is the extent of conducive learning environment in terms of student cohesiveness; open-endedness; integration; rule clarity; and material environment?
2. What is the extent of learning process skills of the learners in terms of observation skills; experimentation skills; measurement skills; communication skills; and inference skills?
3. Is there a significant relationship between conducive learning environment and learning process skills of the students?
4. Which domain of the conducive learning environment best influence the learning process skills of the students?

B. Methods

This study used a quantitative design following a descriptive correlational approach. Quantitative research design refers to the systematic empirical investigation of observable phenomena via statistical, mathematical, or computational techniques. The objective of quantitative research is to develop and employ models, theories, and hypotheses pertaining to natural phenomena (Creswell & Creswell, 2018). A descriptive correlational approach in research is used to describe and measure the degree of association between two or more variables without manipulating them. This approach aims to observe, describe, and document aspects of a situation as it naturally occurs and identify potential relationships between variables. It does not imply causation but rather indicates the strength and direction of the association (Siedlecki, 2020).

In this study, 200 junior high school students (Grade 7-10) in Cluster 4 Public Secondary Schools in Davao City were selected as respondents through stratified random sampling method. Stratified random sampling is a method of sampling that involves dividing a population into distinct subgroups, or strata, that share similar characteristics, and then randomly selecting samples from each stratum. This technique ensures that each subgroup is adequately represented in the sample, enhancing the generalizability and accuracy of the research findings (Taherdoost, 2016). Moreover, the researcher made use of modified and enhanced adapted survey questionnaires which was pilot tested in a nearby school to ensure high reliability and internal consistency of the items in the instrument. *The data collected were subjected on the following statistical tools: Mean, Corelation Analysis, and Regression Analysis.*

C. Results and Discussion

SOP#1: What is the extent of conducive learning environment in terms of student cohesiveness; open-endedness; integration; rule clarity; and material environment?

Conducive learning environment in terms of student cohesiveness was moderately extensive (M=3.23) suggesting that while students generally experience a sense of belonging and collaborative spirit, there are areas for improvement to fully optimize this aspect of the classroom setting. Student cohesiveness refers to the quality of relationships among students, including mutual respect, support, and the ability to work well together in group activities. According to Johnson and Johnson (2019), moderate levels of student cohesiveness can positively impact learning outcomes by fostering a supportive and collaborative classroom atmosphere. However, achieving higher levels of cohesiveness is essential for maximizing student engagement and academic performance. This indicates the need for targeted interventions and strategies, such as cooperative learning activities and team-building exercises, to strengthen peer

relationships and enhance the overall learning environment. By improving student cohesiveness, educators can create more dynamic and interactive classrooms that support better educational experiences and outcomes.

Conducive learning environment in terms of open-endedness was extensive (M=3.81). A high level of a conducive learning environment, characterized by open-endedness, significantly fosters creativity, critical thinking, and problem-solving skills among students. Open-ended learning environments encourage students to explore multiple solutions and approaches to problems, which can enhance their engagement and intrinsic motivation. According to Kim and Pekrun (2019), such environments stimulate deeper cognitive processes and allow students to take ownership of their learning, resulting in improved academic outcomes. Furthermore, open-ended tasks provide opportunities for collaborative learning, where students can share diverse perspectives and develop their communication and teamwork skills. By creating a classroom atmosphere that values inquiry and exploration, educators can support the holistic development of students' learning process skills, preparing them for complex real-world challenges. This approach aligns with contemporary educational theories that emphasize the importance of student-centered and inquiry-based learning strategies.

Conducive learning environment in terms of integration was extensive (M=3.72). When educational environments are highly integrated, they support diverse learning styles and provide students with multiple avenues to access and engage with content, fostering deeper understanding and retention. According to O'Connor and Geiger (2019), such environments not only enhance academic achievement but also promote critical thinking and collaborative skills among students. The integration of digital tools, hands-on activities, and interactive teaching strategies creates a dynamic classroom setting where students are actively involved in their learning processes. This approach is particularly beneficial in subjects like Technology and Livelihood Education (TLE), where practical application and theoretical knowledge must be seamlessly blended. Therefore, the high level of integration in a conducive learning environment is crucial for maximizing student engagement and learning outcomes.

Conducive learning environment in terms of rule clarity was extensive (M=3.66). An extensive rule clarity within a conducive learning environment significantly enhances students' learning process skills by providing a structured and predictable setting that minimizes confusion and maximizes focus. Clear rules and expectations help students understand what is required of them, thereby reducing anxiety and promoting a sense of security that allows for better cognitive engagement. According to Smith and Kovacs (2019), when students are aware of classroom rules and procedures, they are more likely to participate actively and adhere to academic norms, which facilitates a more

effective and orderly learning environment. This clarity also enables teachers to manage classrooms more efficiently, thereby allocating more time to instructional activities rather than disciplinary issues. As a result, the overall learning experience is improved, fostering higher academic achievement and better social interactions among students. Consequently, emphasizing rule clarity as a component of a conducive learning environment is essential for optimizing educational outcomes.

Conducive learning environment in terms of material environment was extensive (M=3.47). The material environment includes the availability and quality of physical resources such as textbooks, laboratory equipment, technological tools, and classroom infrastructure. According to Gislason (2019), well-resourced learning environments are strongly correlated with improved student engagement, motivation, and academic performance. When students have access to adequate and up-to-date materials, they are better equipped to participate actively in lessons, conduct experiments, and engage in hands-on activities that foster critical thinking and practical skills. Moreover, the presence of a well-maintained material environment can reduce distractions and create a more organized and focused atmosphere, which is essential for effective learning. Thus, investing in the material aspects of a learning environment is crucial for facilitating high-quality education and fostering the overall development of students' learning process skills.

Overall, conducive learning environment was extensive (M=3.58). This shows that an extensive conducive learning environment for secondary school students significantly enhances their academic performance and overall development by fostering an atmosphere that supports engagement, collaboration, and active learning. According to Dorman et al. (2019), such environments are characterized by well-maintained facilities, availability of educational resources, and supportive relationships among students and teachers. These factors contribute to a positive school climate that encourages student motivation and participation, leading to improved learning outcomes.

Additionally, a conducive learning environment addresses the diverse needs of students by providing flexible learning spaces and incorporating technology that facilitates interactive and personalized learning experiences. As noted by Fisher and Newton (2020), creating and maintaining high-quality learning environments is essential for promoting student well-being and academic success, underscoring the importance of continuous investment in educational infrastructure and resources.

SOP#2: What is the extent of learners' inquisitiveness in terms of imagination, learning instinct, inferential; and eagerness?

Learning process skills of the students in terms of observation skills was extensive (M=3.99). Extensive learning process skills, particularly in terms of observation skills, play a critical role in the academic development of students. Observation skills enable students to accurately notice and interpret details, which is essential for subjects requiring practical application and hands-on learning, such as in Technology and Livelihood Education (TLE). According to Anders and Evans (2019), students with strong observation skills are better able to understand complex concepts and processes because they can effectively gather and analyze information from their surroundings. This capability not only enhances their academic performance but also prepares them for real-world problem-solving and decision-making tasks. Developing robust observation skills within a conducive learning environment supports the overall goal of education to foster critical thinking and independent learning, ultimately leading to more engaged and competent learners.

Learning process skills of the students in terms of experimentation skills was extensive (M=3.72). Experimentation skills enable students to formulate hypotheses, conduct experiments, and analyze results, which are essential for subjects that require empirical investigation and practical application. According to Chi and Wylie (2019), students who develop strong experimentation skills are more likely to engage in active learning, enhance their critical thinking abilities, and gain a better grasp of scientific methodologies. These skills not only contribute to improved academic performance but also prepare students for future scientific endeavors and problem-solving scenarios. By cultivating experimentation skills within a supportive and well-equipped learning environment, educators can help students become more independent learners and innovative thinkers, ultimately leading to a higher quality of education and better preparedness for real-world challenges.

Learning process skills of the students in terms of measurement skills was extensive (M=3.68). Measurement skills enable students to accurately quantify and assess various parameters, which is essential for subjects that require precision and analysis, such as physics, chemistry, and technology education. According to Hopfenbeck et al. (2019), students who develop strong measurement skills are better equipped to perform experiments, interpret data, and solve real-world problems that involve quantitative assessment. These skills not only enhance their academic performance in STEM (Science, Technology, Engineering, and Mathematics) subjects but also foster critical thinking and attention to detail. By emphasizing measurement skills within a conducive learning environment, educators can help students build a solid foundation for

scientific inquiry and technological proficiency, ultimately preparing them for future academic and professional challenges.

Learning process skills of the students in terms of communication skills was extensive (M=3.65). Communication skills enable students to express their ideas clearly, collaborate effectively with peers, and engage meaningfully in classroom discussions. According to Mercer-Mapstone and Matthews (2019), students who develop strong communication skills are better able to articulate their understanding, ask insightful questions, and participate in collaborative learning activities. These skills are crucial for fostering a supportive learning environment where students feel confident in sharing their thoughts and contributing to group work. Enhancing communication skills within a conducive learning environment not only improves academic performance but also prepares students for future roles in various fields where effective communication is key. By prioritizing the development of communication skills, educators can help students build the confidence and competence needed to succeed in both their academic and professional lives.

Learning process skills of the students in terms of inference skills was extensive (M=3.54). Inference skills enable students to connect disparate pieces of information, predict outcomes, and develop deeper understanding through analysis and synthesis. According to Kılıç and Çepni (2020), students who cultivate strong inference skills are better equipped to tackle complex problems, engage in higher-order thinking, and apply their knowledge to new situations. These skills are essential for success in various academic disciplines, particularly in science and mathematics, where interpreting data and making informed predictions are key components of the learning process. By fostering inference skills within a conducive learning environment, educators can enhance students' critical thinking and analytical abilities, thereby preparing them for academic challenges and real-world problem-solving. Prioritizing the development of inference skills helps build a foundation for lifelong learning and intellectual growth.

Overall, learning process skills of the students was extensive (M=3.72). Extensive learning process skills among secondary school students, such as critical thinking, problem-solving, and collaborative abilities, are essential for academic success and lifelong learning. These skills enable students to engage deeply with content, apply their knowledge in various contexts, and work effectively with peers. According to Lavy and Naama-Ghanayim (2020), students who develop robust learning process skills exhibit higher levels of academic achievement and are better prepared for future educational and career challenges. In the context of modern education, fostering these skills requires a supportive and engaging learning environment that encourages active participation and reflective thinking. Schools that prioritize the development of learning process skills provide students with the tools they need to navigate complex

information, make informed decisions, and collaborate successfully in diverse settings. As educational paradigms shift towards more student-centered approaches, the emphasis on cultivating these skills becomes increasingly crucial for preparing students to thrive in an ever-evolving global landscape.

SOP#3: Is there significant relationship between conducive learning environment and learning process skills of the students?

There is a significant relationship between conducive learning environment and learning process skills of the students. A conducive learning environment, characterized by elements such as well-equipped classrooms, supportive teaching practices, and a positive school culture, directly impacts students' ability to develop critical learning process skills such as critical thinking, problem-solving, and collaboration. According to Rimm-Kaufman and Sandilos (2019), when students are placed in an environment that supports their academic and emotional needs, they are more likely to engage deeply with the material, participate in classroom activities, and apply their knowledge effectively. This engagement leads to improved learning outcomes and the development of essential skills that are crucial for academic success and future career readiness.

Moreover, supporting this view, Taylor and Parsons (2020) found that schools that invest in creating a supportive and stimulating learning environment see higher levels of student motivation and achievement. Their research highlights that element such as interactive and flexible learning spaces, access to technology, and a culture of collaboration and respect among students and teachers significantly enhance the learning experience. These findings indicate that a conducive learning environment does more than just improve academic performance; it also fosters the development of key process skills that enable students to become independent and effective learners. By prioritizing the creation of such environments, educators and policymakers can ensure that students are equipped with the skills needed to navigate complex information, think critically, and work collaboratively in an ever-changing world.

SOP#4: Which domain of the conducive learning environment best influence the learning process skills of the learners?

Conducive TLE laboratory environment in terms of open-endedness, rule clarity, and material environment significantly influenced the learning process skills of the students. Conducive TLE laboratory environment in terms of open-endedness significantly influenced the learning process skills of the students ($B=0.164$, $p<0.05$). Open-ended learning environments allow students to explore various solutions to problems, engage in hands-on activities, and experiment without the fear of failure, thereby enhancing

their learning experience. According to Hämäläinen et al. (2019), environments that support open-ended inquiry encourage students to take ownership of their learning, develop resilience, and think more deeply about the subject matter. This approach not only improves students' technical skills but also prepares them for real-world challenges by promoting a mindset of exploration and innovation.

Conducive TLE laboratory environment in terms of rule clarity significantly influenced the learning process skills of the students ($B=0.266$, $p<0.05$). Rule clarity helps in establishing a safe and orderly environment where students understand the expectations, procedures, and consequences, which in turn promotes disciplined and effective learning. According to McLean et al. (2019), clear and consistent rules in the classroom enhance students' ability to concentrate, engage in tasks, and develop critical skills such as problem-solving, collaboration, and independent learning. When students are aware of and understand the laboratory rules, they are more likely to take initiative, follow procedures correctly, and work collaboratively with their peers. This clarity not only reduces distractions and disruptions but also fosters a sense of responsibility and confidence among students, ultimately leading to improved learning outcomes and the development of essential process skills.

Conducive TLE laboratory environment in terms of material environment significantly influenced the learning process skills of the students ($B=0.230$, $p<0.05$). Access to high-quality materials, equipment, and technology enables students to engage in experiential learning, which is crucial for developing technical skills, problem-solving abilities, and critical thinking. As noted by Zhang and Hyun (2019), an enriched material environment supports students in conducting experiments, building projects, and exploring various vocational tasks, thereby enhancing their understanding and retention of the subject matter. This practical engagement helps students connect theoretical knowledge with real-world applications, fostering a deeper and more comprehensive learning experience. By investing in a well-resourced material environment, educators can create an optimal setting for students to develop essential process skills that are vital for both academic and future career success.

D. Conclusions

The study concluded that a conducive TLE (Technology and Livelihood Education) laboratory environment plays a crucial role in enhancing the learning process skills of students, with both elements being described as extensive. Specifically, the aspects of open-endedness, rule clarity, and a well-equipped material environment were found to significantly influence students' development of critical skills such as problem-solving, critical thinking, and practical application. These findings underscore the importance of creating an educational setting that supports exploration, provides clear guidelines, and

offers adequate resources, which together foster a dynamic and effective learning experience. By prioritizing these factors, educators and policymakers can ensure that students are well-prepared for both academic success and future vocational challenges, ultimately contributing to their overall personal and professional growth.

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References

Alegre, A., & Cebrian, G. (2019). Impact of the learning environment on student engagement and learning outcomes. *Journal of Educational Research and Practice, 10*(1), 23-38.

Anders, D., & Evans, M. (2019). The role of observation skills in student learning and development. *Journal of Educational Psychology, 111*(2), 245-258.

Bernardo, A. B. I., & Garcia, P. R. J. M. (2021). Educational environments and student outcomes: Exploring new paradigms in the Philippine context. *Journal of Educational Research and Development, 12*(3), 45-59.

Chi, M. T. H., & Wylie, R. (2019). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist, 54*(4), 219-243.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Darling-Hammond, L., Burns, D., Campbell, C., Goodwin, A. L., Hammerness, K., Low, E. L., ... & Zeichner, K. (2019). *Empowered educators: How high-performing systems shape teaching quality around the world*. John Wiley & Sons.

Dorman, J. P., Aldridge, J. M., & Fraser, B. J. (2019). *Creating a positive learning environment: Classroom management and practice*. Routledge

Fisher, K., & Newton, C. (2020). Reshaping learning: A critical analysis of learning environments in schools. *Educational Research and Reviews, 15*(1), 10-22.

Gislason, N. (2019). The material environment of schools: Design, implementation, and management. *Educational Research and Evaluation, 25*(1-2), 1-24.

Hämäläinen, R., De Wever, B., Nissinen, K., & Cincinnato, S. (2019). What makes the difference – PIAAC as a resource for understanding the problem-solving skills of Europe's higher-education adults. *Computers & Education, 129*, 13-22.

Hopfenbeck, T. N., Stobart, G., & Daly, A. L. (2019). Assessment and learning: Fields apart? *Assessment in Education: Principles, Policy & Practice, 26*(3), 225-235.

Johnson, D. W., & Johnson, R. T. (2019). The impact of cooperative learning on student engagement: Results from an intervention. *Journal of Educational Research, 112*(3), 365-373.

Kılıç, D., & Çepni, S. (2020). The effect of inquiry-based learning on students' inference skills in science. *Journal of Science Education and Technology, 29*(3), 330-342.

Kim, C., & Pekrun, R. (2019). Emotions and motivation in learning and performance. *Learning and Instruction, 29*(1), 1-2.

Lavy, V., & Naama-Ghanayim, E. (2020). How can active learning enhance student achievement and engagement? *Journal of Educational Psychology, 112*(1), 119-136.

McLean, L., Abry, T., Taylor, M., & Jimerson, S. R. (2019). Associations between culturally responsive practices and students' experiences: School climate as a mediating factor. *Psychology in the Schools, 56*(9), 1614-1631

Mercer-Mapstone, L., & Matthews, K. E. (2019). Student perceptions of communication skills in undergraduate science. *International Journal of Science Education, 41*(4), 517-532.

O'Connor, P., & Geiger, M. (2019). Integrating technology and pedagogy: Impacts on student engagement and learning outcomes. *Journal of Educational Technology Research and Development, 67*(1), 45-62.

Reyes, M. E., Mendoza, M. R., & Castillo, R. C. (2019). Educational inequities in the Philippines: Insights and challenges. *Journal of Educational Administration and History, 51*(2), 97-112.

Rimm-Kaufman, S. E., & Sandilos, L. E. (2019). Improving students' relationships with teachers to provide essential supports for learning. *American Psychological Association*. Retrieved from https://www.apa.org/education/k12/relationships

Sia, L., & Chua, R. (2020). The role of TLE laboratories in promoting practical skills and motivation among students. *International Journal of Technology and Design Education, 30*(2), 67-82.

Siedlecki, S. L. (2020). Understanding descriptive research designs and methods. *Clinical Nurse Specialist, 34*(1), 8-12. https://doi.org/10.1097/NUR.0000000000000493

Smith, T. W., & Kovacs, J. (2019). Classroom management strategies: The impact of clear rules and expectations on student behavior and learning. *Journal of Educational Research and Practice, 10*(2), 123-136.

Taherdoost, H. (2016). Sampling methods in research methodology; How to choose a sampling technique for research. *International Journal of Academic Research in Management (IJARM), 5*(2), 18-27. https://doi.org/10.2139/ssrn.3205035

Taylor, L., & Parsons, J. (2020). Improving the learning environment through flexible learning spaces. *Educational Research and Reviews, 15*(5), 285-296.

Zhang, Y., & Hyun, J. H. (2019). The impact of a well-equipped educational environment on student engagement and learning outcomes. *Journal of Educational Technology & Society, 22*(3), 67-77.

Zhao, Y. (2020). *An education crisis is a terrible thing to waste: How radical changes can spark student excitement and success*. Teachers College Press.