

The Effect of Temperature Towards ESL Students' Reading Interest in the ESL Classroom

¹Evelyn Philip, ²Mariann Edwina Mariadass

¹Universiti Pertahanan Nasional Malaysia

Language Centre

E-mail: itisevelynphilip@outlook.com

Corresponding Author:

²Universiti Pertahanan Nasional Malaysia

Language Centre

E-mail: edwina@upnm.edu.my

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ABSTRACT

Students' motivation level, interest, and cognitive performance are greatly affected by the classroom environment. Among these physical aspects that have been found to have a significant effect on students' interest level and cognitive processing, especially during reading processes, is temperature. This study aims to synthesize relevant studies in environmental psychology, second language acquisition, and ESL to examine the effect of classroom temperature on ESL students' interest in reading. According to the review, the willingness of ESL students to read, their attention span, and their emotional comfort are all positively affected by pleasant temperature conditions, which are between 22°C and 25°C. Extreme temperature conditions may decrease the reading motivation and increase the mental workload. In order to enhance the reading motivation for ESL students, various suggestions have been proposed for teachers and school officials regarding the ideal thermal conditions for the surroundings.

Keywords: temperature, ESL classroom, reading interest, learning environment, thermal comfort

Introduction

In ESL situations, where more mental processing is necessary for deciphering and comprehending written text, reading interest is an important factor in effective second language acquisition. Few investigations have examined the factors of physical classroom situations, though numerous researchers have focused on methods of instruction, learning resources, and student motivation. One of these environmental factors is temperature, which is considered one of the important aspects but is sometimes taken for granted. Students who experience discomfort due to temperature may be easily distracted and less interested in their lessons, especially in reading assignments. This study aims to determine the effect of temperature on ESL students' interest in reading.

Literature Review

Classroom Environment and Learning

The physical state of the classroom has a big impact on students' behaviour and academic achievement. The learning environment is shaped by a variety of factors, including temperature, seating configurations, lighting, and noise levels (Earthman, 2004). While uncomfortable

environments may lead to lower motivation and work avoidance, comfortable surroundings promote more involvement. According to Barrett et al. (2015), a considerable amount of the variation in student learning outcomes can be explained by environmental design.

Temperature and Cognitive Functioning

Cognitive processes like memory, concentration, and information processing are directly affected by thermal comfort. Research indicates that the performance of cognitive tasks is impaired by both high and low temperatures (Wargocki & Wyon, 2013). As noted by Hedge (2000), when the body uses cognitive resources to maintain physiological comfort, temperatures outside the 22°C–25°C range may divert mental concentration. These findings suggest that tasks requiring concentration, like reading, may be impaired by temperature-induced cognitive strain.

Temperature and Reading Engagement

Comfort promotes not just active participation but also active attention and concentration while reading environments, especially for ESL students (Renandya & Jacobs, 2016). Emotions are likewise affected by environmental factors. For example, heat discomfort may cause stress or annoyance, which may result in reduced reading persistence (Haverinen-Shaughnessy & Shaughnessy, 2015). Learners may be at greater risk for unfavorable temperature conditions while reading an ESL text because it requires more mental processing than reading their native language.

ESL Learners and Environmental Sensitivity

Cognitive issues like digesting new words, deciphering complex grammar, and making sense of it all are common for ESL students. According to Sweller's cognitive load hypothesis (2011), high levels of environmental stress, such as uncomfortable temperature, will increase overall cognitive load, which in turn decreases learning task capacity. Thus, ESL student reading interest will be more affected by temperature compared to native reading interest.

Methodology

The approach employed in this article can be categorized as conceptual. This is because it provides a brief overview of all the empirical studies done on learning environment, temperature, and ESL reading motivation. Data collection was not done; instead, the theoretical relationship between temperature and ESL reading interest can be supported by drawing examples from peer-reviewed journals.

Discussion

Optimal Temperature Ranges

Temperatures between 22 and 25 degrees Celsius have been identified as optimal for learning in various studies (Wargocki & Wyon, 2013). Students will be more attentive, pain will be less, and cognitive abilities will be stabilized in this range.

Impacts on ESL Reading Interest

Effects of Non-Optimal Classroom Temperature on ESL Reading Interest

Restlessness and Lethargy

Classroom conditions characterized by temperatures outside the optimum range of thermal comfort can cause physiological discomfort among ESL learners, leading to restlessness or languor. High temperatures are often related to fatigue and irritability, while low temperatures can lead to physical

stiffness and lack of alertness, which interfere with learners' engagement in class activities (Wargoeki & Wyon, 2017). Such physical discomfort can distract learners from reading activities, causing them to often be off-task and lack persistence in reading activities.

Reduced Attention and Reading Comprehension

In addition, thermal discomfort has been proven to affect attention control, which is considered critical for reading comprehension. ESL reading entails various processes such as decoding, vocabulary recognition, and comprehension, all of which are considered highly dependent on students' working memory capacity (Sweller, Ayres, & Kalyuga, 2019). However, since students are distracted by thermal discomfort, they will not be able to utilize cognitive resources for processing language, instead using them to cope with thermal stress, thus compromising accuracy and ability to integrate reading information (Lan, Lian, & Pan, 2019).

Decreased Engagement in Reading Tasks

Motivations of the students to participate in the reading assignments are also affected by physical learning conditions. Unconducive thermal conditions may lead to negative emotional reactions toward the activities being conducted in class. Such negative emotional reactions may cause the students to be reluctant to take part in class discussions pertaining to reading assignments (Dörnyei & Ryan, 2015). For ESL learners, unconducive learning conditions may cause the learners to be reluctant to take part in class activities.

Increased Cognitive Load and Lowered Motivation

From the perspective of cognitive load, physical discomfort is an extraneous cognitive load because it disrupts the efficiency of the learning process (Sweller et al., 2019). ESL learners are already under considerable intrinsic mental pressures due to the novelty of the vocabulary and syntactical structures. When the learners are under additional mental pressures due to thermal discomfort, the combined effect of the intrinsic and extrinsic pressures results in mental fatigue and demotivates the learners from continuing to struggle with the reading passages.

Benefits of Thermally Comfortable Classrooms for ESL Reading Engagement

Sustained Attention and On-Task Behavior

Thermally comfortable classrooms facilitate sustained attention and stability in on-task behaviors, which are critical for reading comprehension activities. Research findings suggest that thermally comfortable conditions facilitate optimal levels of alertness and minimize distractions, enabling learners to focus their attention during prolonged mental activities such as reading and text comprehension (Wargoeki & Wyon, 2017). Improved attention stability in ESL learners facilitates efficient processing and accuracy in comprehension activities.

Increased Motivation to Interact With Reading Materials

A physically comfortable learning environment is beneficial for the emotional states and motivational dispositions of students. When students are comfortable, they are more willing to take part in class activities and be actively engaged in reading materials (Dörnyei & Ryan, 2015). A comfortable learning environment fosters the persistence of the students in reading tasks, active participation of the students in collaborative reading tasks, and the willingness of the students to tackle complex reading materials in a second language.

Emotional Comfort and Readiness to Learn

Thermal comfort has a significant association with emotional states and psychological well-being in a classroom environment. Students who enjoy a stable physical environment are unlikely to exhibit irritability or anxiety. This improves their willingness to learn (OECD, 2019). In addition, emotional comfort plays a vital role in ESL students since they might be experiencing language anxiety. A comfortable physical environment can eliminate emotional barriers to confidence during reading.

Improved Comprehension Through Reduced Mental Stress

This is because reduced physical stress enables students to use more cognitive resources for higher-order cognitive processes such as inference-making and critical analysis. Research indicates that conducive learning environments facilitate students' retention of learned material and improve their cognitive processing of learning material (Lan et al., 2019). ESL students in thermally regulated environments show improved understanding of reading material and are better at applying reading strategies appropriately.

Educational Implications for Enhancing ESL Reading Interest

Maintaining Classroom Temperatures Between 22°C and 25°C

Maintaining the class temperature at the recommended range of 22°C to 25°C has been largely linked to optimal cognitive performance and student comfort (ASHRAE, 2020). The range of 22°C to 25°C is ideal because it reduces physiological stress while allowing for concentration during class activities. In ESL reading instruction, the conditions are vital to encourage prolonged reading without disengaging due to fatigue.

Ensuring Effective Ventilation Systems

An efficient ventilation system also helps in thermal regulation and indoor air quality, both of which are related to cognitive performance and reduced drowsiness among students (Wargoeki et al., 2020). An efficient ventilation system helps maintain a constant temperature and reduces humidity, thus providing greater comfort for students during reading sessions, especially in CDeL technology-mediated classrooms.

Utilizing Fans, Air Conditioning, and Blinds for Environmental Control

The strategic application of mechanical and natural temperature-controlling instruments, including fans, air conditioners, and blinds, facilitates the regulation of the classroom environment. This minimizes external heat and enhances air circulation, especially in tropical countries like Malaysia (Zainal et al., 2021). Environmental adaptability ensures that the classroom environment remains conducive for learning at all times, hence encouraging reading habits.

Monitoring Students' Comfort Levels Through Feedback

Monitoring students' perceptions of comfort in the classroom helps educators detect issues related to the environment that may influence learning outcomes. Student feedback tools, such as small surveys or online polls, can help educators make data-driven decisions and create a student-centric learning environment (OECD, 2019).

Creating Supportive Learning Environments for Reading Engagement

Thermal comfort should be viewed as a vital element in supportive learning environments that enhance reading interest and language acquisition. If physical conditions match students' cognitive and emotional requirements, teaching methods are more likely to be effective, making students more receptive to reading instruction (Dörnyei & Ryan, 2015). Therefore, environmental management

should be included in a wider teaching plan in ESL literacy acquisition, especially in computerized distance e-learning (CDeL) settings.

Conclusion

One of the most important aspects of the environment, which impacts ESL pupils' motivation for reading, is temperature. Although extreme temperatures have a negative influence on reading comprehension and motivation for reading, a pleasant temperature enhances motivation, involvement, and cognitive performance. The need to maintain optimum temperatures cannot be overstated, as it is essential for enhancing performance, as ESL reading demands a lot of mental strain. For ESL reading development, temperature is one factor that educators and legislators need to consider.

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