sure that the feedback provided is beneficial and helps students grow or improve in their learning.

Even though the study used a large sample size, there are some limitations which should be taken into account in future investigations. First, the study relied on self-reports, which is a subjective measure. Therefore, to gain a deeper knowledge, future research should include other methods of data collection such as experiments, interviews, or observations. The second limitation concerns the sample which included students of different academic majors and years as an overall view of higher education. Future studies may specify a specific academic major (e.g., Mathematics, Business Studies, Engineering) or year group. The third limitation was asking for perspectives of CLE from the students only. To understand more about these issues, the next study should ask for perspectives of both students and instructors. Lastly, other learning environments may be affected by variation in academic achievement, such as innovation in teaching, and competition among students.

Acknowledgements

Our thanks to the Petchra Pra Jom klao Ph.D. Research scholarship, King Mongkut's University of Technology Thonburi, Thailand for funding this research.

References

- Ahmed, Y., Taha, M.H., Al-Neel, S., & Gaffar, A.M. (2018). Students' perception of the learning environment and its relation to their study year and performance in Sudan. *International Journal of Medical Education*, 9, 145–150.
- Aldridge, J.M., Fraser, B.J., & Huang, T.-C.I. (1999). Investigating Classroom Environments in Taiwan and Australia with multiple research methods. *The Journal of Educational Research*, 93(1), 48–62.
- Blackburn, M. (1998). *Academic cheating*. Unpublished doctoral dissertation, University of Oklahoma.
- Brown, G.T., Peterson, E.R., & Yao, E.S. (2016). Student conceptions of feedback: Impact on self-regulation, self-efficacy, and academic achievement. *British Journal of Educational Psychology*, 86(4), 606–629.
- Chionh, Y.H., & Fraser, B.J. (2009). Classroom environment, achievement, attitudes and self-esteem in geography and mathematics in Singapore. *International Research in Geographical and Environmental Education*, 18(1), 29–44.
- Cosmovici, E.M., Idsoe, T., Bru, E., & Munthe, E. (2009). Perceptions of learning environment and on-task orientation among students reporting different achievement levels:

- A study conducted among Norwegian secondary school students. *Scandinavian Journal of Educational Research*, 53(4), 379–396.
- DiFrancesca, D., Nietfeld, J.L., & Cao, L. (2016). A comparison of high and low achieving students on self-regulated learning variables. *Learning and Individual Differences*, 45, 228–236.
- Gang, R. (2018). What makes a good learning environment. Retrieved 14/03/2020, from https://raccoongang.com/blog/what-makes-good-learning-environment/
- Greene, B.A., Miller, R.B., Crowson, H.M., Duke, B.L., & Akey, K.L. (2004). Predicting high school students' cognitive engagement and achievement: Contributions of classroom perceptions and motivation. *Contemporary Educational Psychology*, 29, 462–482.
- Healy, M., Doran, J., & McCutcheon, M. (2018). Cooperative learning outcomes from cumulative experiences of group work: Differences in student perceptions. *Accounting Education*, 27(3), 286–308.
- Herrmann, K.J. (2013). The impact of cooperative learning on student engagement: Results from an intervention. *Active Learning in Higher Education*, *14*(3), 175–187.
- Hsiung, C.M. (2012). The effectiveness of cooperative learning. *Journal of Engineering Education*, 101(1), 119–137.
- Ji, C., Duffield, S., Wageman, J.J., & Welch, A.G. (2017). Student perceptions of the classroom learning environment and motivation to learn Chinese. *Chinese as a Second Language*. *The journal of the Chinese Language Teachers Association, USA*, 52(2), 111–126.
- Lane, K.L., Menzies, H.M., Ennis, R.P., Oakes, W.P., Royer, D.J., & Lane, K.S. (2018). Instructional choice: An effective, efficient, low-intensity strategy to support student success. *Beyond Behavior*, 27(3), 160–167.
- Lee, H.-J., Kim, H., & Byun, H. (2017). Are high achievers successful in collaborative learning? An explorative study of college students' learning approaches in team project-based learning. *Innovations in Education and Teaching International*, 54(5), 418–427.
- Lu, G., Hu, W., Peng, Z., & Kang, H. (2014). The influence of undergraduate students' academic involvement and learning environment on learning outcomes. *International Journal of Chinese Education*, *2*(2), 265–288.
- Malik, R.H., & Rizvi, A.A. (2018). Effect of classroom learning environment on students' academic achievement in mathematics at secondary level. *Bulletin of Education and Research*, 40(2), 207–218.
- Mulliner, E., & Tucker, M. (2015). Feedback on feedback practice: Perceptions of students and academics. *Assessment & Evaluation in Higher Education*, 42(2), 266–288.
- Mullola, S., Hintsanen, M., & Keltikangas-Järvinen, L. (2015). Temperament and motivation. *International Encyclopedia of the Social & Behavioral Sciences*, 24(2), 184–190.
- Oliver, P.H., Guerin, D.W., & Gottfried, A.W. (2007). Temperamental task orientation: Relation to high school and college educational accomplishments. *Learning and Individual Differences*, 17(3), 220–230.
- Pitt, E., Bearman, M., & Esterhazy, R. (2020). The conundrum of low achievement and feedback for learning. *Assessment & Evaluation in Higher Education*, 45(2), 239–250.
- Radovan, M., & Makovec, D. (2015). Relations between students' motivation, and percep-

- tions of the learning environment. *Center for Educational Policy Studies Journal*, 5(2), 115–138.
- Rita, R.D., & Martin-Dunlop, C.S. (2011). Perceptions of the learning environment and associations with cognitive achievement among gifted biology students. *Learning Environments Research*, 14(1), 25–38.
- Sichinga, K., Mfuni, J., Nenty, H., & Chakalisa, P. (2014). Factors influencing quality of feedback in teaching in Botswana senior secondary schools. *International Journal of Research In Social Sciences*, 4(1), 26–37.
- Tran, V.D. (2014). The effects of cooperative learning on the academic achievement and knowledge retention. *International journal of higher education*, *3*(2), 131–140.
- Tsay, M., & Brady, M. (2010). A case study of cooperative learning and communication pedagogy: Does working in teams make a difference? *Journal of the Scholarship of Teaching and Learning*, 10(2), 78–89.
- Velayutham, S., & Aldridge, J.M. (2013). Influence of psychosocial classroom environment on students' motivation and self-regulation in science learning: A structural equation modeling approach. *Research in Science Education*, 43(2), 507–527.
- Wang, M.-T. (2012). Educational and career interests in math: A longitudinal examination of the links between classroom environment, motivational beliefs, and interests. *Developmental psychology*, 48(6), 1643.
- Wang, M.-T., & Holcombe, R. (2010). Adolescents' perceptions of school environment, engagement, and academic achievement in average school. *American Educational Research Journal*, 47(3), 633–662.
- Xu, J. (2011). Homework completion at the secondary school level: A multilevel analysis. *The Journal of Educational Research*, *104*(3), 171–182.
- Yaduvanshi, S., & Singh, S. (2019). Fostering achievement of low-, average-, and high-achievers students in Biology through structured cooperative learning (STAD method). *Education Research International*, 2019.
- Yang, X. (2015). Rural junior secondary school students' perceptions of classroom learning environments and their attitude and achievement in mathematics in West China. *Learning Environments Research*, 18(2), 249–266.
- Zakaria, E., Solfitri, T., Daud, Y., & Abidin, Z.Z. (2013). Effect of cooperative learning on secondary school students' mathematics achievement. *Creative Education*, 4(2), 98.