STEAM EmbRaCe

A STEAM project for Empathy, Resilience and Creativity

STEAM and Social and Emotional learning

The integration of STEAM (Science, Technology, Engineering, Arts, and Mathematics) and Social and Emotional learning (SEL) is becoming increasingly important in education. This is because STEAM education is not just about teaching technical skills and knowledge, but also about fostering creativity, critical thinking, problem-solving, and collaboration. At the same time, SEL focuses on developing students' emotional intelligence, empathy, self-awareness, and social skills, which are essential for success in life.

Integrating SEL with STEAM can help students **develop a growth mindset**, which is the belief that intelligence and abilities can be developed through hard work and dedication. This mindset can help students persevere through challenges and setbacks, and ultimately succeed in their STEAM learning.

In addition, connecting STEM with SEL **promotes collaboration**. STEAM education often requires students to work in groups or teams to solve problems. When SEL is integrated into the learning process, students can develop social skills such as communication, teamwork, and empathy, which are essential for effective collaboration.

SEL and STEAM both focus on **fostering creativity and innovation.** When these two approaches are combined, students can learn to think outside the box and develop new and innovative solutions to complex problems.

Overall connecting STEAM and SEL **prepares students for the future.** In today's rapidly changing world, students need to be equipped with both technical and social-emotional skills to succeed. Integrating STEAM and SEL can help students develop a wide range of skills that are essential for success in the 21st century workforce. By combining STEAM and SEL approaches to learning, educators can create a holistic learning experience that prepares students for the challenges and opportunities of the future.

Selected recent bibliography :

Abali, B. Y., & Yazici, H. (2020). An evaluation on determining the relation between listening skill and social emotional learning skill. *Eurasian Journal of Educational Research*, *2020*(89). https://doi.org/10.14689/ejer.2020.89.4

Ahmed, I., Hamzah, A. B., & Abdullah, M. N. L. Y. B. (2020). Effect of social and emotional learning approach on students' social- emotional competence. *International Journal of Instruction*, *13*(4). https://doi.org/10.29333/iji.2020.13441a

Araúz Ledezma, A. B., Massar, K., & Kok, G. (2021). Social Emotional Learning and the promotion of equal personal relationships among adolescents in Panama: A study protocol. *Health Promotion International*, *36*(3). https://doi.org/10.1093/heapro/daaa114

Belbase, S., Mainali, B. R., Kasemsukpipat, W., Tairab, H., Gochoo, M., & Jarrah, A. (2022). At the dawn of science, technology, engineering, arts, and mathematics (STEAM) education: prospects, priorities, processes, and problems. *International Journal of Mathematical Education in Science and Technology*, *53*(11). https://doi.org/10.1080/0020739X.2021.1922943

Daunic, A. P., Corbett, N. L., Smith, S. W., Algina, J., Poling, D., Worth, M., Boss, D., Crews, E., & Vezzoli, J. (2021). Efficacy of the social-emotional learning foundations curriculum for kindergarten and first grade students at risk for emotional and behavioral disorders. *Journal of School Psychology*, *86*. https://doi.org/10.1016/j.jsp.2021.03.004

Edgar, S. N., & Elias, M. J. (2020). Setting the stage for Social Emotional Learning (SEL) policy and the arts. *Arts Education Policy Review*. https://doi.org/10.1080/10632913.2020.1777494

Garner, P. W., Gabitova, N., Gupta, A., & Wood, T. (2018). Innovations in science education: infusing social emotional principles into early STEM learning. *Cultural Studies of Science Education*, *13*(4). https://doi.org/10.1007/s11422-017-9826-0

Ingram, E., Reddick, K., Honaker, J. M., & Pearson, G. A. (2021). Making Space for Social and Emotional Learning in Science Education. *Frontiers in Education*, *6*. https://doi.org/10.3389/feduc.2021.712720

Khazanchi, R., Khazanchi, P., Mehta, V., & Tuli, N. (2021). Incorporating Social–Emotional Learning to Build Positive Behaviors. *Kappa Delta Pi Record*, *57*(1). https://doi.org/10.1080/00228958.2021.1851581

Lawson, G. M., McKenzie, M. E., Becker, K. D., Selby, L., & Hoover, S. A. (2019). The Core Components of Evidence-Based Social Emotional Learning Programs. *Prevention Science*, *20*(4). https://doi.org/10.1007/s11121-018-0953-y

Mahil, S. (2016). Fostering STEM+ education: Improve design thinking skills. *IEEE Global Engineering Education Conference, EDUCON*, *10-13-April-2016*. https://doi.org/10.1109/EDUCON.2016.7474542

Marín-Marín, J. A., Moreno-Guerrero, A. J., Dúo-Terrón, P., & López-Belmonte, J. (2021). STEAM in education: a bibliometric analysis of performance and co-words in Web of Science. In *International Journal of STEM Education* (Vol. 8, Issue 1). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1186/s40594-021-00296-x

Odell, M., & Kennedy, T. (2022). THE IMPACT OF PROJECT-BASED AND PROBLEM-BASED LEARNING MODEL ON STEM ACHIEVEMENT AND SOCIAL EMOTIONAL LEARNING. *INTED2022 Proceedings*, *1*. https://doi.org/10.21125/inted.2022.0594

Perignat, E., & Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative literature review. *Thinking Skills and Creativity*, *31*. https://doi.org/10.1016/j.tsc.2018.10.002

Peterson, A. (2018). Connecting STEM Curriculum with Social Emotional Learning in Early Childhood. *Undergraduate Research Journal*, *22*.

Peterson, A., Gaskill, M., & Cordova, J. (2018). Connecting STEM with social emotional learning (SEL) curriculum in elementary education. *Society for Information Technology & Teacher Education International Conference*, *2018*(1).

Spyropoulou, C., Wallace, M., Vassilakis, C., & Poulopoulos, V. (2020). Examining the use of STEAM Education in Preschool Education. *European Journal of Engineering Research and Science*. https://doi.org/10.24018/ejers.2020.0.cie.2309

(Abali & Yazici, 2020; Ahmed et al., 2020; Araúz Ledezma et al., 2021; Belbase et al., 2022; Daunic et al., 2021; Edgar & Elias, 2020; Garner et al., 2018; Ingram et al., 2021; Khazanchi et al., 2021; Lawson et al., 2019; Mahil, 2016; Marín-Marín et al., 2021; Odell & Kennedy, 2022; Perignat & Katz-Buonincontro, 2019; Peterson, 2018; Peterson et al., 2018; Spyropoulou et al., 2020)

Abali, B. Y., & Yazici, H. (2020). An evaluation on determining the relation between listening skill and social emotional learning skill. *Eurasian Journal of Educational Research*, *2020*(89). https://doi.org/10.14689/ejer.2020.89.4

Ahmed, I., Hamzah, A. B., & Abdullah, M. N. L. Y. B. (2020). Effect of social and emotional learning approach on students' social- emotional competence. *International Journal of Instruction*, *13*(4). https://doi.org/10.29333/iji.2020.13441a

Araúz Ledezma, A. B., Massar, K., & Kok, G. (2021). Social Emotional Learning and the promotion of equal personal relationships among adolescents in Panama: A study protocol. *Health Promotion International*, *36*(3). https://doi.org/10.1093/heapro/daaa114

Belbase, S., Mainali, B. R., Kasemsukpipat, W., Tairab, H., Gochoo, M., & Jarrah, A. (2022). At the dawn of science, technology, engineering, arts, and mathematics (STEAM) education: prospects, priorities, processes, and problems. *International Journal of Mathematical Education in Science and Technology*, *53*(11). https://doi.org/10.1080/0020739X.2021.1922943

Daunic, A. P., Corbett, N. L., Smith, S. W., Algina, J., Poling, D., Worth, M., Boss, D., Crews, E., & Vezzoli, J. (2021). Efficacy of the social-emotional learning foundations curriculum for kindergarten and first grade students at risk for emotional and behavioral disorders. *Journal of School Psychology*, *86*. https://doi.org/10.1016/j.jsp.2021.03.004

Edgar, S. N., & Elias, M. J. (2020). Setting the stage for Social Emotional Learning (SEL) policy and the arts. *Arts Education Policy Review*. https://doi.org/10.1080/10632913.2020.1777494

Garner, P. W., Gabitova, N., Gupta, A., & Wood, T. (2018). Innovations in science education: infusing social emotional principles into early STEM learning. *Cultural Studies of Science Education*, *13*(4). https://doi.org/10.1007/s11422-017-9826-0

Ingram, E., Reddick, K., Honaker, J. M., & Pearson, G. A. (2021). Making Space for Social and Emotional Learning in Science Education. *Frontiers in Education*, *6*. https://doi.org/10.3389/feduc.2021.712720

Khazanchi, R., Khazanchi, P., Mehta, V., & Tuli, N. (2021). Incorporating Social–Emotional Learning to Build Positive Behaviors. *Kappa Delta Pi Record*, *57*(1). https://doi.org/10.1080/00228958.2021.1851581

Lawson, G. M., McKenzie, M. E., Becker, K. D., Selby, L., & Hoover, S. A. (2019). The Core Components of Evidence-Based Social Emotional Learning Programs. *Prevention Science*, *20*(4). https://doi.org/10.1007/s11121-018-0953-y

Mahil, S. (2016). Fostering STEM+ education: Improve design thinking skills. *IEEE Global Engineering Education Conference, EDUCON*, *10-13-April-2016*. https://doi.org/10.1109/EDUCON.2016.7474542

Marín-Marín, J. A., Moreno-Guerrero, A. J., Dúo-Terrón, P., & López-Belmonte, J. (2021). STEAM in education: a bibliometric analysis of performance and co-words in Web of Science. In *International Journal of STEM Education* (Vol. 8, Issue 1). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1186/s40594-021-00296-x

Odell, M., & Kennedy, T. (2022). THE IMPACT OF PROJECT-BASED AND PROBLEM-BASED LEARNING MODEL ON STEM ACHIEVEMENT AND SOCIAL EMOTIONAL LEARNING. *INTED2022 Proceedings*, *1*. https://doi.org/10.21125/inted.2022.0594

Perignat, E., & Katz-Buonincontro, J. (2019). STEAM in practice and research: An integrative literature review. *Thinking Skills and Creativity*, *31*. https://doi.org/10.1016/j.tsc.2018.10.002

Peterson, A. (2018). Connecting STEM Curriculum with Social Emotional Learning in Early Childhood. *Undergraduate Research Journal*, *22*.

Peterson, A., Gaskill, M., & Cordova, J. (2018). Connecting STEM with social emotional learning (SEL) curriculum in elementary education. *Society for Information Technology & Teacher Education International Conference*, *2018*(1).

Spyropoulou, C., Wallace, M., Vassilakis, C., & Poulopoulos, V. (2020). Examining the use of STEAM Education in Preschool Education. *European Journal of Engineering Research and Science*. https://doi.org/10.24018/ejers.2020.0.cie.2309