prenda
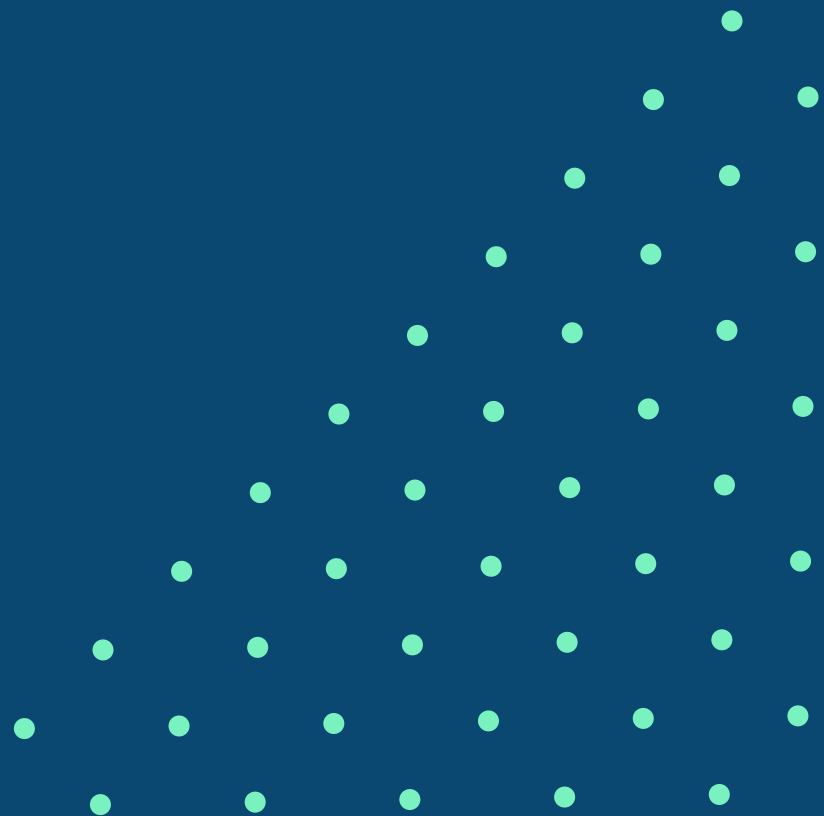
RESEARCH ALIGNMENT

Executive Summary

Data clearly indicate that "school" as traditionally formatted isn't working well for many students. For example, [motivation and engagement](#) rates are reportedly falling and low national [academic proficiency](#) persists. In an effort to remedy these negative trends and increase the percentage of students who are thriving personally and academically, we focus our pedagogy and practice on 3 key pillars.

Pillar 1: Connection

We cultivate connection by providing students with warm, accepting, and supportive relationships regardless of academic performance or behavior. This creates an environment that fosters superlative brain development and mental wellness.

Pillar 2: Personalization

We prioritize personalization by ensuring that each student is encouraged to work at a level and pace that allows for mastery and by incorporating personal interests into learning. This means that each student is treated as an individual and allowed the flexibility they need to succeed.

Pillar 3: Ownership

We honor student ownership of the learning process by providing developmentally appropriate, autonomy-supportive environments. This leads students to take responsibility for their learning and fosters self-efficacy.

Pillar 1: Connection

We cultivate connection by providing students with warm, accepting, and supportive relationships, regardless of academic performance or behavior.

Rationale

The region of the brain involved in goal-directed behavior, sustained attention, memory, inhibition, information processing, learning, problem-solving, and decision-making is called the Prefrontal Cortex (PFC). This area of the brain goes offline when the body's stress response system is triggered. One of the main things that activates the stress response system is when a child feels like their relationship with one of their primary caregivers (parent/teacher) is at risk. This means that if we want our students to learn, stay focused, and behave well, we must offer them warmth, acceptance, and support regardless of their academic or behavioral struggles.

Research

➡️ **The PFC plays a vital role in executive functioning, emotional regulation, attention, learning, and behavioral inhibition.**

Neuropsychology of Prefrontal Cortex
Siddiqui SV, Chatterjee U, Kumar D, Siddiqui A, Goyal N. Neuropsychology of prefrontal cortex. Indian J Psychiatry. 2008 Jul;50(3):202-8. doi: 10.4103/0019-5545.43634. PMID: 19742233; PMCID: PMC2738354.

Prefrontal Contribution to Decision-Making
Funahashi, S. (2017). Prefrontal Contribution to Decision-Making under Free-Choice Conditions. Frontiers in Neuroscience, 11. https://doi.org/10.3389/fnins.2017.00431

Prefrontal Cortex and Executive Function in Young Children
Moriguchi, Y., & Hiraki, K. (2013). Prefrontal cortex and executive function in young children: A review of NIRS studies. Frontiers in Human Neuroscience, 7. https://doi.org/10.3389/fnhum.2013.00867

➡️ **The PFC goes offline when the sympathetic nervous system activates the stress response, making it difficult for students to learn, focus, manage emotions, and inhibit behavior.**

Neurobiology of executive functions: catecholamine influences on prefrontal cortical functions
Arnsten AF, Li BM. Neurobiology of executive functions: catecholamine influences on prefrontal cortical functions. Biol Psychiatry. 2005 Jun 1;57(11):1377-84. doi: 10.1016/j.biopsych.2004.08.019. PMID: 15950011.

[Limbic Regulation of Hypothalomo-Pituitary-Adrenocortical Function During Acute and Chronic Stress](#)
Jankord, R., & Herman, J. P. (2008). Limbic Regulation of Hypothalomo-Pituitary-Adrenocortical Function During Acute and Chronic Stress. Annals of the New York Academy of Sciences, 1148, 64. https://doi.org/10.1196/annals.1410.012

[Acute stressors and cortisol responses: a theoretical integration and synthesis of laboratory research](#)
Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: a theoretical integration and synthesis of laboratory research. Psychological Bulletin, 130(3), 355–391. https://doi.org/10.1037/0033-2909.130.3.355

➡️ **Prolonged stress response causes long-term cognitive and social issues including decreased working memory and self-regulation.**

[Childhood poverty, chronic stress, and adult working memory](#)
Evans, G. W., & Schamberg, M. A. (2009). Childhood poverty, chronic stress, and adult working memory. Proceedings of the National Academy of Sciences of the United States of America, 106(16), 6545-6549. https://doi.org/10.1073/pnas.0811910106

[Temperament, social competence, and adrenocortical activity in preschoolers](#)
Gunnar MR, Tout K, de Haan M, Pierce S, Stansbury K. Temperament, social competence, and adrenocortical activity in preschoolers. Dev Psychobiol. 1997 Jul;31(1):65-85. doi: 10.1002/(sici)1098-2302(199707)31:1<65::aid-dev6>3.0.co;2-s. PMID: 9222117.

[Stress and the Development of Self-Regulation in Context](#)
Blair, C. (2010). Stress and the Development of Self-Regulation in Context. Child development perspectives, 4(3), 181. https://doi.org/10.1111/j.1750-8606.2010.00145.x

➡️ **The stress response and its subsequent negative effects can be mitigated by a consistent, supportive adult-child relationship. Relationships and attachment predict social and academic outcomes.**

[Protecting Adolescents From Harm. Findings from the National Longitudinal Study on Adolescent Health](#)
Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., Tabor, J., Beuhring, T., Sieving, R. E., Shew, M., Ireland, M., Bearinger, L. H., & Udry, J. R. (1997). Protecting adolescents from harm. Findings from the National Longitudinal Study on Adolescent Health. JAMA, 278(10), 823–832. https://doi.org/10.1001/jama.278.10.823

[Social Regulation of the Cortisol Levels in Early Human Development](#)
Gunnar, M. R., & Donzella, B. (2002). Social regulation of the cortisol levels in early human development. Psychoneuroendocrinology, 27(1-2), 199-220. https://doi.org/10.1016/S0306-4530(01)00045-2

Fostering Secure Attachment in Infants in Maltreating Families Through Preventive Interventions
Cicchetti, D., Rogosch, F.A., & Toth, S.L. (2006). Fostering secure attachment in infants in maltreating families through preventive interventions. Development and Psychopathology, 18(03). https://doi.org/10.1017/s0954579406060329

Attachment and Biobehavioral Catch-up: Addressing the Needs of Infants and Toddlers Exposed to Inadequate or Problematic Caregiving
Dozier, M., & Bernard, K. (2017). Attachment and Biobehavioral Catch-up: Addressing the Needs of Infants and Toddlers Exposed to Inadequate or Problematic Caregiving. Current opinion in psychology, 15, 111. https://doi.org/10.1016/j.copsyc.2017.03.003

Family Resources and Parenting Quality: Links to children's cognitive development across the first 3 years
Lugo-Gil, J., & Tamis-LeMonda, C. S. (2008). Family resources and parenting quality: links to children's cognitive development across the first 3 years. Child development, 79(4), 1065–1085. https://doi.org/10.1111/j.1467-8624.2008.01176.x

Maternal Responsiveness and Children's Achievement of Language Milestones
Tamis-LeMonda, C. S., Bornstein, M. H., & Baumwell, L. (2001). Maternal responsiveness and children's achievement of language milestones. Child development, 72(3), 748–767. https://doi.org/10.1111/1467-8624.00313

Attachment and School Completion: Understanding Young People Who Have Dropped Out of High School and Important Factors in Their Re-Enrollment
Ramsdal, G. H., & Wynn, R. (2022). Attachment and School Completion: Understanding Young People Who Have Dropped Out of High School and Important Factors in Their Re-Enrollment. International Journal of Environmental Research and Public Health, 19(7). https://doi.org/10.3390/ijerph19073938

Resources

Why Adults Need to Matter More Than Peers by Gordon Neufeld
Hold On to Your Kids by Gordon Neufeld and Gabor Mate
Reclaiming Our Students by Hannah Beach & Tamara Strijack
The Development of the Person by L. Alan Stroufe, et al
How Children Succeed by Paul Tough
Stress 101: Don't Go NUTS with Dr. Sonia Lupien

Pillar 2: Personalization

We prioritize personalization by ensuring that each student is treated as an individual and allowed the flexibility required to learn in ways that meet their unique needs and interests.

Rationale

With the advent of ubiquitous access to information and technological advances in our modern age, education no longer needs to be limited by the one-size-fits-all system established in the 19th century. Individualized learning systems have been shown to be as effective as (or better than) whole-group instruction. By adopting a personalized approach to pacing, learning method, and content choices students will be better able to reach their full potential as they increase in curiosity, creativity, and collaborative problem-solving.

Research

➡️ **Mastery-based learning allows students to develop skills and knowledge at their own pace, ensuring that academic foundations are strong before moving on.**

The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring
Bloom, B. S. (1984). The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring. Educational Researcher, 13, 4-16.
http://dx.doi.org/10.3102/0013189X013006004

Research on Mastery-Based Group Learning Programs: A Meta-Analysis
Guskey, T. R., & Pigott, T. D. (1988). Research on group-based mastery learning programs: A meta-analysis. The Journal of Educational Research, 81(4), 197–216.
https://doi.org/10.1080/00220671.1988.10885824

Effectiveness of Mastery Learning Programs: A Meta-Analysis.
Kulik, C. L. C., Kulik, J. A., & Bangert-Drowns, R. L. (1990, June). Effectiveness of Mastery Learning Programs: A Meta-Analysis. Review of Educational Research, 60(2), 265–299. https://doi.org/10.3102/00346543060002265

Transforming Learning through Competency-Based Education
Patrick, S. (2021). Transforming Learning through Competency-Based Education. State Education Standard, 21(2), 23–29. https://eric.ed.gov/?id=EJ1315095

➡ Using instructional methods that meet each student at their current level of understanding while also supporting students in their personalized pace strengthens feelings of competence and improves outcomes.

Continued Progress: Promising Evidence on Personalized Learning
Pane, John F., et al. (2015). Continued Progress: Promising Evidence on Personalized Learning. ERIC, RAND Corporation, 1 Nov. 2015, eric.ed.gov/?id=ED571009.

The Rise of K-12 Blended Learning
Horn, M., Staker, H., Hassel, B., & Ableidinger, J. (2011). The Rise of K-12 Blended Learning. https://aurora-institute.org/wp-content/uploads/The-Rise-of-K-12-Blended-Learning.pdf

The Results of Implementing Zone of Proximal Development on Learning Outcomes
Baker, Ryan & Ma, Wei & Zhao, Yuxin & Wang, Shengni & Ma, Zhenjun. (2020). The Results of Implementing Zone of Proximal Development on Learning Outcomes.

How to Personalize Learning in K-12 Schools: Five Essential Design Features
Lee, D. (2014). How to Personalize Learning in K-12 Schools: Five Essential Design Features. *EducationalTechnology*, *54*(3), 12–17. http://www.jstor.org/stable/44430266

➡ Both mastery and personalized pacing can be implemented effectively using adaptive digital learning tools as a primary means of instruction.

Intelligent Tutoring Systems and Learning Outcomes: A Meta-Analysis
Ma, W., Adesope, O., Nesbit, J., & Liu, Q. (2014). Intelligent Tutoring Systems and Learning Outcomes: A Meta-Analysis. https://www.apa.org/pubs/journals/features/edu-a0037123.pdf

When adaptive learning is effective learning: comparison of an adaptive learning system to teacher-led instruction
Shuai Wang, Claire Christensen, Wei Cui, Richard Tong, Louise Yarnall, Linda Shear & Mingyu Feng (2023) When adaptive learning is effective learning: comparison of an adaptive learning system to teacher-led instruction, Interactive Learning Environments, 31:2, 793-803, DOI: 10.1080/10494820.2020.1808794

The Relative Effectiveness of Human Tutoring, Intelligent Tutoring Systems, and Other Tutoring Systems
VanLEHN, K. (2011). The Relative Effectiveness of Human Tutoring, Intelligent Tutoring Systems, and Other Tutoring Systems. Educational Psychologist, 46(4), 197–221.https://doi.org/10.1080/00461520.2011.611369

A Comprehensive Historical Survey with Recent Developments
Alkhatlan, A., & Kalita, J. (2019). Intelligent Tutoring Systems: A Comprehensive Historical Survey with Recent Developments. *International Journal of Computer Applications*, *181*(43), 1–20. https://doi.org/10.5120/ijca2019918451

➡️ **Guided inquiry and project or problem-based learning, when paired with direct instruction, increases engagement and curiosity while maintaining or improving outcomes.**

Traditional and Inquiry-Based Learning Pedagogy: A Systematic Critical Review
Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., Tabor, J., Beuhring, T., Sieving, R. E., Shew, M., Ireland, M., Bearinger, L. H., & Udry, J. R. (1997). Protecting adolescents from harm. Findings from the National Longitudinal Study on Adolescent Health. JAMA, 278(10), 823–832. https://doi.org/10.1001/jama.278.10.823

Let's Talk Evidence - The case for combining inquiry-based and direct instruction
Gunnar, M. R., & Donzella, B. (2002). Social regulation of the cortisol levels in early human development. Psychoneuroendocrinology, 27(1-2), 199-220. https://doi.org/10.1016/S0306-4530(01)00045-2

Problem-Based Learning in K–12 Education: Is it Effective and How Does it Achieve its Effects?
Wirkala, C., & Kuhn, D. (2011). Problem-Based Learning in K–12 Education: Is it Effective and How Does it Achieve its Effects? American Educational Research Journal, 48(5), 1157–1186. https://doi.org/10.3102/0002831211419491

Resources

Let's Teach for Mastery by Sal Khan
What is Mastery Learning with Khan Acadamy
The Difference Between Traditional Education and Personalized,
Competency-Based Education with Knowledge Works
Implementing Mastery Learning by Thomas Guskey
Mastery Learning with Thomas Guskey with Corwin Leaders Podcast

Pillar 3: Ownership

We honor student ownership of the learning process by providing developmentally appropriate autonomy-supportive environments.

Rationale

The world we have built for our children and students consistently suggests to them that they cannot be trusted, that they are incapable, and that the only way to succeed is to jump through the hoops we've laid out for them. Unfortunately, feeling untrusted, incapable, and like you have little control over life negatively impacts academic achievement, motivation, mental well-being, and engagement. By creating a new educational system and culture where adults allow young people to make meaningful decisions, trust them to lead, and provide ample opportunity for them to learn from their mistakes we hope to increase engagement, motivation, achievement, and effective self-governance.

Research

➡️ **Providing students with increased autonomy over their educational experience drives academic achievement, motivation, and mental well-being.**

Student Autonomy and Empowerment
Adolescent and School Health | CDC. (2021, August 18). www.cdc.gov. https://www.cdc.gov/healthyyouth/classroom-management/student_autonomy.htm

Parent Autonomy Support, Academic Achievement, and Psychosocial Functioning: a Meta-analysis of Research
Vasquez, A. C., Patall, E. A., Fong, C. J., Corrigan, A. S., & Pine, L. (2015). Parent Autonomy Support, Academic Achievement, and Psychosocial Functioning: a Meta-analysis of Research. Educational Psychology Review, 28(3), 605–644. https://doi.org/10.1007/s10648-015-9329-z

Effects of Parental Autonomy Support and Teacher Support on Middle School Students' Homework Effort
Feng, X., Xie, K., Gong, S., Gao, L., & Cao, Y. (2019). Effects of Parental Autonomy Support and Teacher Support on Middle School Students' Homework Effort: Homework Autonomous Motivation as Mediator. Frontiers in Psychology, 10. https://doi.org/10.3389/fpsyg.2019.00612
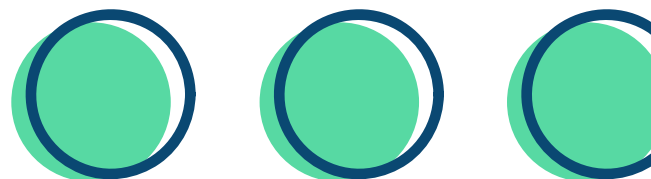
➡ Providing students with experiences that support their sense of personal control and competence fosters grit and self-efficacy.

Learning From Human Tutoring
Chi, Michelene & Siler, Stephanie & Jeong, Heisawn & Yamauchi, Takashi & Hausmann, Robert. (2001). Learning from human tutoring. Cognitive Science. 25. 471-533. 10.1016/S0364-0213(01)00044-1.

Learned Helplessness: Theory and Evidence
Maier, S., & Seligman, M. (1976). Learned Helplessness: Theory and Evidence. *Journal OI Experimental Psychology: General*, *105*(1), 3–46. https://ppc.sas.upenn.edu/sites/default/files/lhtheoryevidence.pdf

The Effects of Locus of Control on Learning Performance
Özen Kutanis, Rana & Mesci, Muammer. (2011). The Effects of Locus of Control on Learning Performance: A Case of an Academic Organization. Journal of Economic and Social Studies. 1. 10.14706/JECOSS11125.

Locus of Control and Academic Achievement in High School Students
Shepherd, S., Owen, D., Fitch, T. J., & Marshall, J. L. (2006). Locus of Control and Academic Achievement in High School Students. Psychological Reports, 98(2), 318–322. https://doi.org/10.2466/pr0.98.2.318-322

Intrinsic Motivation and the Process of Learning: Beneficial Effects of Contextualization, Personalization, and Choice.
Cordova, Diana & Lepper, Mark. (1996). Intrinsic Motivation and the Process of Learning: Beneficial Effects of Contextualization, Personalization, and Choice. Journal of Educational Psychology. 88. 715-730. 10.1037/0022-0663.88.4.715.

Children's Preference for Challenge: The role of perceived competence and control.
Boggiano, A. K., Main, D. S., & Katz, P. A. (1988). Children's preference for challenge: The role of perceived competence and control. Journal of Personality and Social Psychology, 54(134-41). https://doi.org/10.1037//0022-3514.54.1.134

School and family effects on the ontogeny of children's interests, self-perceptions, and activity choices.
Eccles, J. S. (1992). School and family effects on the ontogeny of children's interests, self-perceptions, and activity choices. *Nebraska Symposium on Motivation. Nebraska Symposium on Motivation*, *40*(40), 145–208. https://pubmed.ncbi.nlm.nih.gov/1340520/

➡ Respecting student ownership by decreasing adult use of extrinsic motivators fosters a greater sense of personal purpose, long-term enjoyment of learning, and increased motivation.

Intrinsic and Extrinsic Motivational Orientations in the Classroom
Lepper, M. R., Corpus, J. H., & Iyengar, S. S. (2005). Intrinsic and Extrinsic Motivational Orientations in the Classroom: Age Differences and Academic Correlates. Journal of Educational Psychology, 97(2), 184–196. https://doi.org/10.1037/0022-0663.97.2.184

A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation.
Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin, 125(6), 627–668.

When do extrinsic rewards undermine intrinsic motivation? A meta-analysis
Lehtivuori, A. (2023). When do extrinsic rewards undermine intrinsic motivation? A meta-analysis

Making Learning Fun: A Taxonomy of Intrinsic Motivations for Learning
Malone, T.W. and Lepper, M.R. (1987) Making Learning Fun: A Taxonomy of Intrinsic Motivations for Learning. In: Snow, R.E. and Farr, M.J., Eds., Aptitude, Learning and Instruction III: Conative and Affective Process Analyses, Erlbaum, ê Hillsdale.

Resources

Promoting Motivation, Health, and Excellence by Edward Deci
Creating Autonomy-Supportive Learning Environment by Jon Salk
The Self-Driven Child by Ned Johnson and William Stixrud
Raising Human Beings by Ross Green
Punished by Rewards by Alphie Kohn
Self-Determination Theory by Ryan and Deci

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