Optimizing EdTech for an Expanded Definition of Student Success

A Research Review for EdTech Developers

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MBZ LABS
Building the Future of Education

Contents

EXECUTIVE SUMMARY

The purpose of this report is to provide a research synthesis about the expanded definition of student success that can be leveraged by EdTech developers to support research-aligned product development. Although research on EdTech lags significantly behind current interests and needs of the market, there is much relevant research about social emotional development and school climate and culture that is applicable to the design of EdTech tools. Drawing on over 100 publications, this report introduces 6 levers for supporting student success, each with 2 critical research-based findings.

Social Emotional Development

Social emotional development refers to the pathway towards attaining the skills, mindsets, and competencies required to set goals, manage behaviors, build and maintain relationships, and learn new information. Teacher learning, instructional design and a developmental approach are key levers to support social emotional development in K-12.

Lever 1. Teacher Learning

1. **Teach social emotional skills to adults, so that they can teach students.** Teachers and administrators need instruction and practice to develop their own social emotional skills, competencies and mindsets. Design tools that help teachers develop social emotional skills or offer professional development that specifically supports teachers' social emotional development in a way that is related to your tool.

2. **Provide professional development for teachers.** Teachers need instruction on how to teach social emotional competencies and benefit from the support of colleagues, coaches, and administrators in this process. Offer well-designed professional development on how to use your product to teach SEL. Make professional development collaborative, hands-on, and ongoing over an extended timeframe.

Lever 2. Instructional Design

1. **Make social emotional instruction *SAFE*.** Effective social emotional curriculum is Sequenced, Active, Focused, and Explicit. If your tool is designed to teach SEL, make sure it offers learning experiences that are intentionally ordered, active/interactive, provide ongoing focus on essential topics, and explicitly instruct students on these topics.

2. **Make social emotional instruction integrated, coordinated, and multi-setting.** Social emotional development and academic learning are deeply intertwined, and both are strengthened with an integrated contextually relevant approach that takes place in a variety of settings. Design tools that allow practitioners to integrate SEL into instruction and across settings.

Lever 3. Developmental Approach

1. **Put the *social* in social emotional learning.** Social emotional development is more social than traditional academic instruction. Design tools that are centered around students' social interactions with peers, teachers, parents, and other supportive adults.

2. **Follow known learning progressions.** Several social emotional skills are known to be building blocks for other more complex skills, indicating that for some aspects of social emotional development, there are appropriate learning progressions. These draw on age, current developmental level, and prior knowledge. If your tool is designed to teach SEL, be sure to introduce skills in a developmentally appropriate sequence.

School Culture and Climate

School culture and climate refers to the overall experience of people in a school setting, including the quality of interpersonal interactions, the alignment of personal experiences with individual goals and perspectives, and the practices used for teaching and learning. Strong relationships, meaningful work, and inclusivity are key levers to support healthy school climate and culture.

Lever 1. Relationships

1. **Foster teacher care and support for students**. Students who feel cared for and supported by teachers are happier and more engaged and exhibit better mental and physical health. Design tools to help students feel more supported by, connected to, and cared for by teachers.

2. **Help students feel like they belong.** Belonging means feeling "accepted, respected, included, and supported" by others at school and in other social environments. Design tools that help students feel like they are a valuable part of the community. Also, ensure your tool doesn't introduce obstacles to belonging.

Lever 2. Meaningful Work

1. **Give students work that they find engaging.** Work that students find meaningful, relevant, and engaging is a hallmark of an effective learning environment, and the perceived value of schoolwork influences the overall school culture and climate. Make sure that curriculum and learning activities associated with or in your tool are meaningful and purposeful for learners, so they will be engaged.

2. **Use alternative and authentic assessments.** Alternative and authentic assessments, including play-based tools and digital games, foster engagement and make learning feel meaningful for students. Design tools that utilize these types of assessments to support and measure learning.

Lever 3. Inclusivity

1. **Avoid bias and demonstrate sensitivity in materials.** Educational materials often unknowingly embed bias and show a lack of sensitivity toward minority students. Inclusivity, at every level, is essential for healthy school culture and climate. Carefully evaluate your tool and materials and for potential biases, and redesign for inclusivity where needed.

2. **Amplify inclusivity with Universal Design for Learning.** Following the Universal Design for Learning research-based guidelines optimizes teaching and learning in order to provide equitable access to all learners. To ensure usability for all learners, consult the Universal Design for Learning Framework.

CONCLUSION

Although several EdTech companies have begun to lay roots in the EDSS marketplace, these are still the early days for this movement. There are many aspects of social emotional development and school culture and climate that could benefit from supportive digital tools yet remain ripe for innovation by the EdTech industry.

Schools, districts, and states need highly effective tools now. While there is not substantial research on what is currently working at the intersection of EdTech and EDSS yet, there is substantial research that is applicable to EDSS that can be leveraged for the evaluation and design of new tools that will meet the growing demands of educators and education leaders. The levers and findings identified in this report are intended to support an increase in research-based innovation in order to provide new tools to education stakeholders that are designed for change with efficacy in mind.

INTRODUCTION

MBZ Labs conducted a comprehensive literature review in partnership with New Schools Venture Fund to identify the information from academic and industry research that can be leveraged to promote the design and development of high-quality educational technology products that are relevant to the expanded definition of student success (EDSS). The purpose of this report is to provide a succinct synthesis of the research for developers that can be leveraged to evaluate products and funding opportunities, design new products, and improve upon existing products that directly or tangentially support student success.

What is the Expanded Definition of Student Success?

Being successful means having the **agency** to make active choices about one's life path, possessing the **competencies** to adapt to the demands of different contexts, and incorporating different aspects of oneself into an **integrated identity**.[1]

We are often limited by the historical fixation of the US education system on a narrow set of outcomes that summarize a single predominant view of success. A strict focus on academic achievement, attendance, and graduation rates fails to offer the complete picture of whether students matriculating from US schools will be successful.

In response to this issue, *New Schools Venture Fund* worked with schools and researchers to identify a set of key indicators associated with a successful life. Drawing on a robust body of literature about transitioning to success in adulthood,[2] they identified the following indicators of a successful life (see Figure 1):

Agency	Pursuing self-determined goals and aspirations
Influence	Making meaningful contributions to the community through acts of service
Citizenship	Pursuing the goals of democracy through thoughtful engagement in the political process
Financial Health	Achieving and maintaining financial stability, with options for upward mobility
Physical Health	Maintaining physical wellness in pursuit of a long and healthy life

Figure 1. Key indicators of a successful life.

New Schools also identified the three domains of youth experience in school that contribute to achieving these five indicators of success. The three domains of youth experience that shape success in life include (see Figure 2):

Academic Foundation	College and career readiness, high-school graduation, and growth and proficiency on academic assessments
Social Emotional Competencies	The ability to set goals, manage behaviors, build and maintain relationships, and process and store relevant new information
School Culture and Climate	Approaches to teaching and learning, expectations, safety, sense of belonging, engagement, and relationships at school

Figure 2. Variables contributing to success in life.

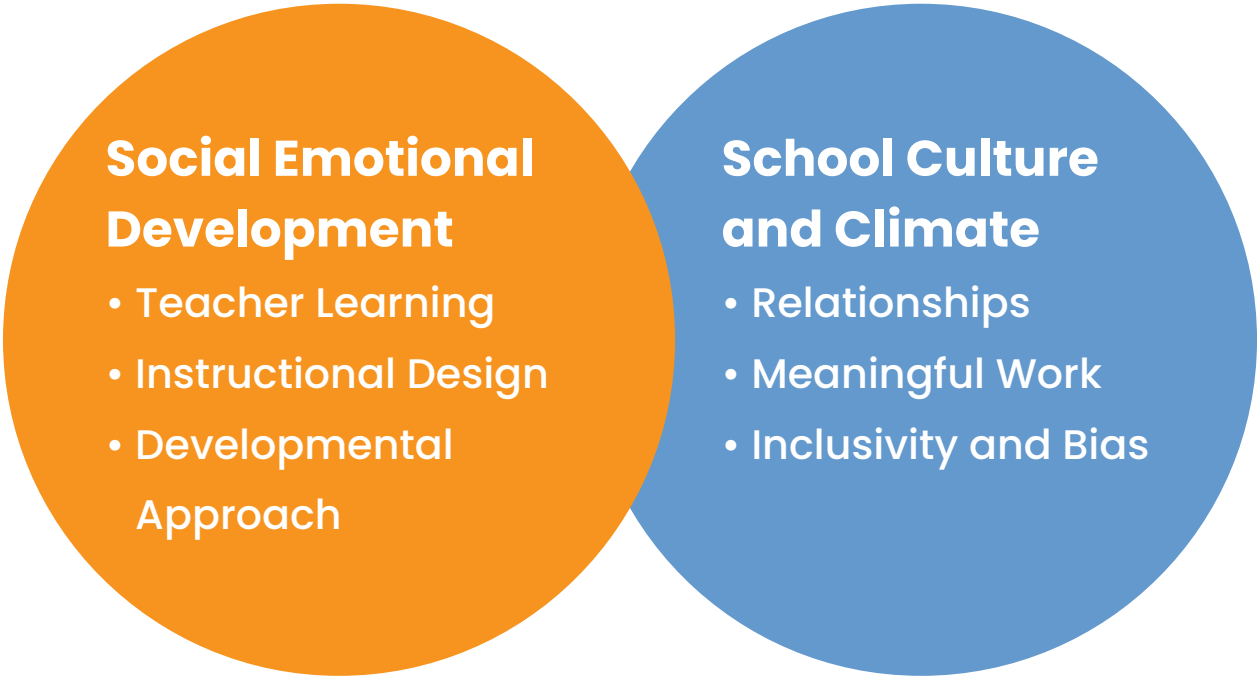
Given this, the E of EDSS refers to the choice to expand the conception of success beyond a set of narrow academic indicators to also include social emotional development and school culture and climate. Researchers agree that these domains are all deeply interrelated:

> **Social, emotional, cognitive, linguistic, academic [development] — are deeply intertwined in the brain and in behavior, and all are central to learning. Strengths or weaknesses in one area foster or impede development in others.** [3]

An expanded definition of success acknowledges and values the mutually reinforcing relationship between school culture and climate, social emotional development, and academic achievement. Evidence is presented throughout this report indicating the ways in which support in each domain bolsters success in the other two. In reality, social emotional development, academic development, and school culture and climate are inextricable and the EDSS framework mirrors that reality.

Given recent changes in national policy that tie EDSS indicators to funding, there is an emerging push for innovation in this space that is largely uncharted territory at this point. Given that this focus is still nascent, technology innovation related to EDSS carries both inherent risk and reward. Like all early waves of technological innovation, there is still opportunity for first-mover advantage in many subsections of this market. While the key players and broad boundaries of the EDSS EdTech marketplace are still uncertain, it

is possible to mitigate the risk by taking into account what is already known from the research about best practices related to social emotional development and school culture and climate. The remaining sections of this report describe a summary of key findings meant to inform those interested in developing or refining products at the intersection of EdTech and EDSS. The next section describes those findings related to social emotional development and the final section describes findings related to climate and culture.



Each section begins by defining key terms then provides readers a high-level synthesis of relevant research followed by actionable findings for evaluating investments, iterating on existing products or building new products related to the EDSS.

SOCIAL EMOTIONAL DEVELOPMENT

What is social emotional development?

In order to become successful adults, students need more than just a strong academic foundation. They also need strong personal, social, and emotional skills. For example, they need to be able to set goals, manage their behavior, build and maintain relationships, and they need to know how to learn on their own.[4] These are called competencies. They fall into three categories- knowledge, skills, and mindsets- and they are the backbone of social emotional development.

One of the challenges with social emotional development is that there is no consensus on exactly what counts in the social emotional domain and what does not. There is also disagreement about the names of various skills, mindsets, and competencies. Should I call this grit or perseverance? Do emotional intelligence lessons satisfy requirement to teach self-awareness or are there other skills involved? There are endless questions like this from those who are getting started in this domain.

To address this conflict, the EASEL Lab at the Harvard Graduate School of Education, reviewed most of the major SEL frameworks and created a dashboard to help users understand the similarities and differences across these frameworks. For those creating products related to SEL, the EASEL interactive visual tools[5] offers insight into what the major frameworks are, and how each names and defines each of the skills and competencies that it covers. At some point, most companies working on SEL must commit to a set of competencies, skills and mindsets that they aim to support. Companies must select and stick with a set of names and definitions. For those engaged in this process, EASEL is a powerhouse of relevant information.

Key Levers for Social Emotional Development

While there is not yet consensus about the names and frames for social emotional learning- there is agreement in the literature about the positive effects of social emotional development. A growing body of research indicates that students who participate in social emotional programs demonstrate positive differences in academic achievement, behavior, and mental health, with some benefits lasting as long as 3.75 years after participating.[6] There is also a set of common findings in the literature about what can be leveraged to improve social emotional development for K-12 students. The next section explores 3 levers that support social emotional development, teacher learning, instructional design, and a developmental approach. For each, a set of 2 key findings are presented that summarize critical knowledge about how the lever works and why it is essential.

Lever 1. Teacher Learning

Teacher Learning refers to the acquisition of new knowledge, development of new skills, and changing attitudes that teachers might adopt in their practice.

Finding 1. Teach social emotional skills to adults, so that they can teach students.

Teachers and administrators need instruction and practice to develop their own social emotional skills, competencies and mindsets.[7]

- There are six primary characteristics of socially and emotionally competent teachers (See Figure 3).
- Although social emotional competence is positively associated with teacher sense of well-being, professional enjoyment, and sense of efficacy, this topic is not given explicit attention in teacher pre-service or in-service teacher training.[8]
- The quality of implementation of social emotional programs and the outcomes associated with these programs depends on teachers' personal levels of social and emotional competence. Thus, teachers need instruction and practice in personal SEL in order to successfully teach this to students.[9]

Self Awareness	Social Awareness	Cultural Sensitivity
Holding a realistic view of personal emotional tendencies, patterns, strengths, and weaknesses, and knowing how to generate effects like joy or enthusiasm.	Understanding emotions of others and knowing how oneself affects others; able to support others, cooperate, and resolve conflicts.	Accounting for different perspectives in relationships with students, parents, and colleagues.
Prosocial Decision Making	**Self Regulation**	**Social Regulation**
Respecting others, taking responsibility for decisions and actions, and making considered and considerate decisions.	Managing emotions, behavior, relationships, and classroom persona even when in emotionally challenging situations.	Balancing respectful setting of firm limits for students with comfort in uncertainty arising from giving students appropriate autonomy.

Figure 3. Characteristics of socially and emotionally competent teacher

DEVELOPER SPOTLIGHT

YOGA FOSTER

Design tools that help teachers develop social emotional skills or offer professional development that specifically supports teachers' social emotional development in a way that is related to your tool.

INDUSTRY EXAMPLE

Yoga Foster is a tool and program designed to teach educators how to integrate mindfulness and yoga practices into their classroom. In addition to supporting the implementation for students, Yoga Foster lowers barriers to entry for teachers inexperienced with yoga or mindfulness practices by teaching concepts and practices and building those skills in teachers.

Finding 2. Provide professional development for teachers.

Teachers need instruction on how to teach social emotional competencies and benefit from the support of colleagues, coaches, and administrators in this process.

- Sustainably changing teacher behavior is difficult.[13] However, the practices detailed in Figure 4 consistently improve the effectiveness of professional development.

- Teachers who receive training that orients them to the knowledge and skills needed to implement a social emotional program show increased effectiveness of program implementation which leads to better outcomes for students.[14]

- The quality of implementation of new social emotional programs is influenced by the support from an effective administrator and the quality of the relationship between the teacher and person coaching them.[15]

Collective Participation
Teachers learning about and reflecting upon new professional practices together
Active Learning
Teachers engaging with new ideas through meaningful and timely discussion, planning, observation, practice, and reflection
Duration
Sufficient time spent, including the duration of time over which the activity is spread and the total amount of hours spent (estimate for success of traditional professional development is at least two hours over one semester) ▲

Figure 4. Indicators of Effective Teacher Professional Development[10, 11, 12]

▲ While research recommends learning over an extended duration, the current research has likely been outpaced by the rise of micro-credentials and just-in-time learning. Given this, a systematic review of feedback from users should be considered to be the most relevant source of information about the efficacy of a teacher learning experience.

DEVELOPER SPOTLIGHT

PERTS

Offer well-designed professional development on how to use your product to teach SEL. Make professional development collaborative, hands-on, and ongoing over an extended timeframe.

INDUSTRY EXAMPLE

PERTS has developed a teacher-facing platform that helps collect data on student attitudes and links those insights with teacher resources to support SEL. As part of their implementation model, PERTS recruits and leverages teacher-leaders to facilitate internal working groups that use data from their tool to support conversations about how to improve practice. PD in PERTS is collaborative, hands-on, and ongoing, and is led primarily by the teachers themselves.

Lever 2. Instructional Design

Instructional Design is how learning experiences are structured and organized. It includes technology tool use, teaching strategies, lesson content, activities, and even classroom layout.

Finding 1. Make social emotional instruction *SAFE*.

Effective social emotional curriculum is Sequenced, Active, Focused, and Explicit.[16]

- SEL programs that simultaneously and intentionally include all four of these recommended practices significantly increase students' social-emotional development.[17]
- Students participating in social emotional programs rated as *SAFE* showed significantly more positive outcomes than students participating in social emotional programs that were not rated as *SAFE*.[18]

Sequenced	Active
Uses an ordered set of activities to achieve objectives. "New behaviors and more complicated skills usually need to be broken down into smaller steps and sequentially mastered, suggesting the benefit of a coordinated sequence of activities that links the learning steps and provides youth with opportunities to connect these steps."[19]	Uses active forms of learning to teach social emotional skills, these require students to act on new material. This means students are not passive recipients of knowledge, instead they are interacting with new ideas and practicing new skills as part of their sense-making.
Focused	**Explicit**
Allots sufficient time and attention to the activities that are intended to teach social emotional skills. Focused social emotional instruction plans for the time needed for students to practice specific skills.	Provides clear and specific learning objectives. Explicit learning objectives are more effective than those stated generally because they orient students to what they are being expected to learn.

Figure 5. Qualities of effective social emotional curriculum.

DEVELOPER SPOTLIGHT

STOP, BREATHE & THINK

If your tool is designed to teach SEL, make sure it offers learning experiences that are intentionally ordered, active/interactive, provide ongoing focus on essential topics, and explicitly instruct students on these topics.

INDUSTRY EXAMPLE

Stop, Breathe & Think is an app that helps foster short, guided meditation practices. In addition to free-standing activities, it includes sequenced, active, focused, and explicit pathways through its Worry Journey and Curb your Stress modules. These modules guide learners through mindfulness practices in a carefully designed series.

Finding 2. Make social emotional instruction integrated, coordinated, and multi-setting.

Social emotional development and academic learning are deeply intertwined, and both are strengthened with an integrated context specific approach that takes place across a variety of settings (i.e. classrooms, hallway, bathroom, playground, home).

- **Integrated** - Academic success is dependent on cognitive, social, and emotional skills.[20] These domains are deeply intertwined and mutually reinforcing therefore, the practice social emotional learning and academics in isolation of one another is out of alignment with how humans naturally learn and develop.

  Learning experiences that include 'rigorous cognitive challenges' and social emotional prompting lead to greater depth of knowledge that is retained for longer than rigorous lessons without a social emotional element.[21] Two ways to prompt social emotional learning are:

- Design learning experiences that elicit strong emotions. Give students tasks that will elicit strong personal and emotional reactions..

- Design learning experiences that are embedded in social interactions. Humans are social creatures and students care a lot about what their peers think and do. Make face to face and online interactions a critical requirement of a learning activity. Provide models that expose students to healthy forms of interaction. Then allow students to practice these interactions with scaffolds in place.

- **Coordinated** - Social emotional skills should be embedded into instruction and school-wide practices.[22] School-wide means that these practices must extend beyond the classroom to places such as hallways and bathrooms. It is best if they are also coordinated across settings and supported collaboratively and consistently by all adults in a student's life.[23]

- **Multi-setting** - Effective social emotional programs are "developmentally and culturally aligned to the needs of students and integrated across settings including the school, home, and community."[24]

DEVELOPER SPOTLIGHT

Design tools that allow practitioners to integrate SEL into instruction and across settings.

INDUSTRY EXAMPLE

Most existing EdTech products that focus on SEL emphasize a particular setting, skillset, or subject area, and tend to emphasize small-scale interventions. Integrating SEL more fully into curriculum and school cultures writ large is an untapped opportunity for developers and funders.

Lever 3. Developmental Approach

Using a **Developmental Approach** means being aware that learners' skills and knowledge build up over time and that some skills and mindsets are prerequisite for others. Students are always changing and growing and their interactions with the people in their lives have a profound influence on this development.

Finding 1. Put the *social* in social emotional learning.

Social emotional development is more social than traditional academic instruction.[25]

- Most models for schooling overlook the essential role of relationships in child development. For social emotional development in particular, the influence of the social context and a child's relationships play a strong role in healthy development (see Figure 6).

Influence of the Social Context
Social emotional competencies develop within a deeply social context and this development is influenced by teachers, peers, and other adults.
Role of Relationships
"Relationships are the fuel for human development; they foster trust and belief, and are a buffer against stress. Children learn through modeling from and interaction with others, whether it be a parent, teacher, other adult or a peer."[26]

Figure 6. Social nature of healthy child development.

DEVELOPER SPOTLIGHT

Design tools that are centered around students' social interactions with peers, teachers, parents, and other supportive adults.

INDUSTRY EXAMPLE

Give Thx teaches gratitude, facilitates feedback, and builds community using an online platform through which learners and teachers send thank you notes to each other and are prompted to reflect on their own gratitude practices. Give Thx strives to strengthen the learning community and build social relationships as a core part of its design.

Finding 2. Follow known learning progressions.

Some social emotional skills are known to be building blocks for other more complex skills, indicating that for some aspects of social emotional development there are appropriate learning progressions. These draw on age, current developmental level, and prior knowledge. [27]

Turn Around Children represents this progression in a graphic representation of the building blocks for learning (see Figure 7). Each skill represented in the framework has been shown in academic research to impact academic achievement and is relevant in educational settings. According to this framework, there is a rough developmental trajectory from foundational skills to higher order skills and that the development of certain skills known as "gateway skills" can limit or enable healthy development of the higher order skills. The bottom two rows in Figure 7 show the gateway skills which develop in tandem with the mindsets in row 3. Together, rows 1 through 3 serve as the foundation for the higher order skills above.

BUILDING BLOCKS FOR LEARNING

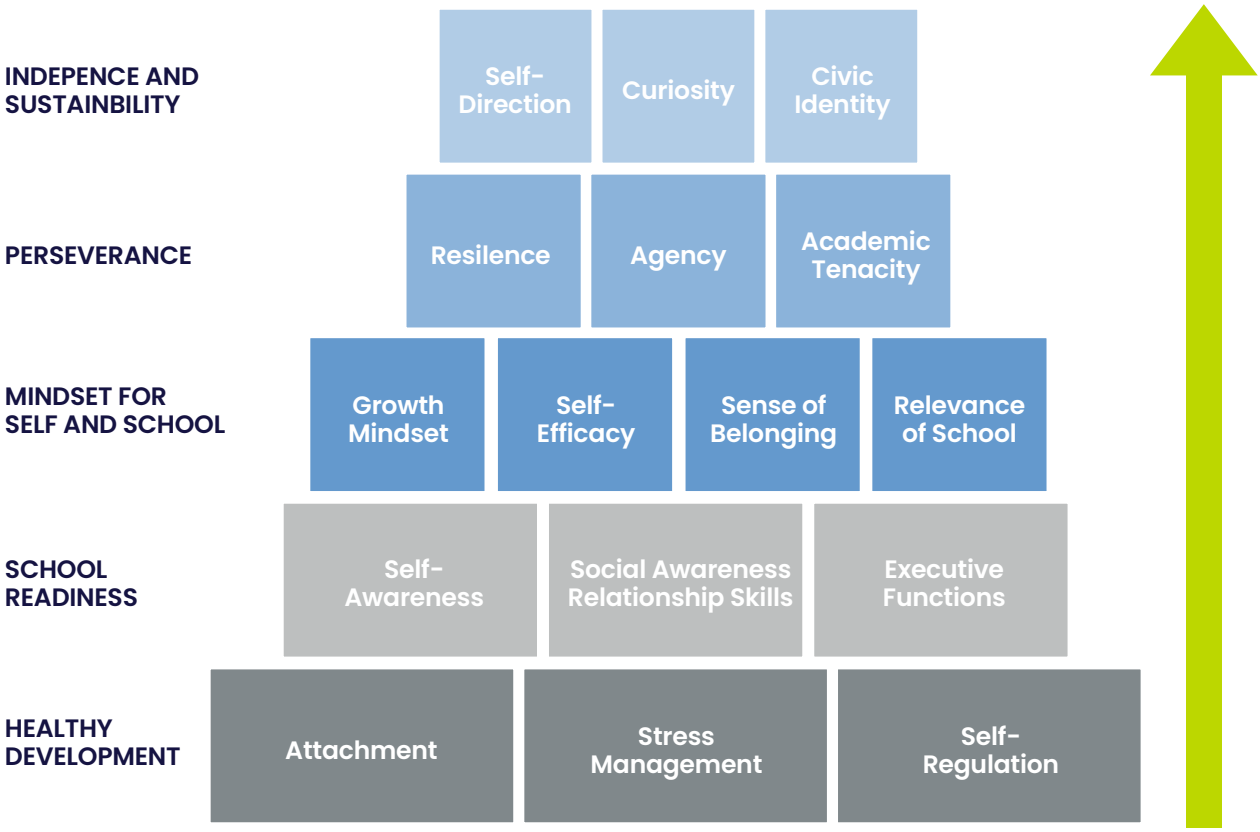


Figure 7. Building Blocks for Learning: A Framework for Comprehensive Student Development.

DEVELOPER SPOTLIGHT

If your tool is designed to teach SEL, be sure to introduce skills in a developmentally appropriate sequence.

INDUSTRY EXAMPLE

Move This World is a video based SEL curriculum designed to foster a safe and supportive learning environment. Students and teachers engage video based social emotional learning activities at the beginning and ending of class sessions, designed to help students identify, express, and manage emotions. Move This World's grade level based exercises are designed with developmental pathways at top of mind, to ensure that students at different ages are interacting with appropriate and effective materials.

SCHOOL CULTURE AND CLIMATE

What is school culture and climate?

School culture and climate refers to the overall experience of people in a school setting, including the quality of interpersonal interactions, the alignment of personal experiences with an individual's goals and perspectives, and the practices used for teaching and learning. Climate both impacts and arises from individual student social emotional skill level, and a positive school climate is associated with broad academic and social emotional benefits. The levers for the development of a healthy school culture and climate are relationships, meaningful work, and inclusivity. Below are key findings related to these levers.

Key Levers for School Culture and Climate

Lever 1. Relationships

Relationships within a school setting include interactions, friendships, and tensions within and across various groups, including teachers, students, administrators, support staff, and parents.

Finding 1. Foster teacher care and support for students.

Students who feel cared for and supported by teachers are happier, more engaged, and exhibit better mental and physical health.[28]

- Students benefit from having an adult at school they trust they can go to with a personal problem. This is a protective factor which helps improve student resilience to setbacks and challenges.
- There are 7 characteristics of teacher care and support. (See Figure 8)

Teacher Care & Support	
Treating students fairly.	Being willing to explain material in depth.
Treating students with respect.	Holding high, but realistic expectations for all students.
Not comparing students to each other.	Being accessible to students, especially when they are in need.
Asking for and valuing student opinions.	

Figure 8. Key characteristics of teacher care and support[29]

DEVELOPER SPOTLIGHT

ACT Tessera

Design tools to help students feel more supported by, connected to, and cared for by teachers.

INDUSTRY EXAMPLE

ACT Tessera combines a well researched and carefully designed SEL assessment with modular curriculum materials to support teachers in teaching a variety of SEL skills. By giving teachers precise insights into their students' understanding of and capacity in a variety of areas of SEL, ACT Tessera helps build teacher care and support by enabling highly personalized and meaningful interventions and instruction.

Finding 2. Help students feel like they belong.

Belonging means feeling "accepted, respected, included, and supported by others in a school social environment."[30]

- There are many factors that impact students' sense of belonging at school, including individual traits, personal relationships, school climate, and broader socio-cultural trends. Most research focuses on the individual traits, personal relationships, and safety. See Figure 9 for details about each.
- Teachers can support students' sense of belonging by working to bridge socio-economic, linguistic, and cultural differences. Students benefit from teachers who share a background with them.[31]
- Belonging supports self-efficacy and life satisfaction, and protects against loneliness, emotional distress, and mental illness, including depression and suicidality.
- A student's level of belonging is a predictor for academic achievement because sense of belonging fosters feelings of connection to school, thereby bolstering motivation, effort, and attendance.

Individual Traits

The most reliable predictors of a student's sense of belonging at school are other personal SEL competencies, such as self-efficacy and conscientiousness. SEL skills support belonging and belonging supports SEL skills.

Personal Relationships

Feeling supported by parents/guardians, as well as by teachers, are key contributors to students' sense of belonging in school. Peer relationships matter for belonging as well, but are less central and impactful than students' relationships with adults.

Safety

Students are more likely to feel they belong when they feel safe at school. This includes both environmental factors, like the surrounding community, and internal school norms. Especially important are clear and consistently enforced school rules around bullying.

Figure 9. Factors that influence students sense of belonging at school.[32]

DEVELOPER SPOTLIGHT

EDUMOTION

Design tools that help students feel like they are a valuable part of the community. Also, ensure your tool doesn't introduce obstacles to belonging.

INDUSTRY EXAMPLE

EduMotion is a tool that integrates movement and SEL curriculum into the classroom. Students are taught and practice dancing exercises alongside geographically focused lessons that introduce various world cultures through images and songs. Students learn SEL concepts like empathy and kindness, while also celebrating diversity, all of which emphasizes the individual belonging of each student in the classroom. They also have the opportunity to see their own cultures represented and celebrated with their classmates in vivid detail.

Lever 2. Meaningful Work

Meaningful Work is work that students believe is relevant to their lives, interesting to them, or otherwise motivating.

Finding 1. Foster teacher care and support for students.

Work that students find meaningful, relevant, and engaging is a hallmark of an effective learning environment.

- Students' perceptions of the value of their schoolwork influences culture and climate.[33]
- Students are most engaged when work is appropriately challenging relative to their current skill level, and relevant to their interests. Giving students developmentally appropriate autonomy and choice over what and how they learn is especially motivating.[34]
- Work that does not take into account students' cultural background can be alienating. By contrast, work that is culturally relevant is much more engaging because it draws on and speaks to diverse student backgrounds.[35]
- There are three forms of student engagement (see Figure 10). Social emotional development is positively linked to all three forms of engagement. More engaged students tend to have more and better SEL competencies and vice versa. The overall school culture benefits from students experiencing all three forms of engagement, as well.

Behavioral Engagement	Complying with classroom norms, showing up for class, paying attention, and completing work.
Emotional Engagement	Showing interest in school and curriculum topics, enjoying school, and feeling a sense of belonging.
Cognitive Engagement	Investing in learning, embracing challenge, going beyond requirements,and finding school useful and purposeful.

Figure 10. Forms of engagement.

DEVELOPER SPOTLIGHT

Purpose Project

Make sure that curriculum and learning activities associated with or in your tool are meaningful and purposeful for learners, so they will be engaged.

INDUSTRY EXAMPLE

The Purpose Project is a combination curriculum and web-based tool for helping students discover, document, and reflect upon their interests and experiences so that they can engage in meaningful real-world projects that help them learn new skills or build on existing competencies. Their curriculum activities and materials are student-centered, collaborative, and fun, while also supporting desired learning outcomes.

Finding 2. Use alternative and authentic assessments.

Alternative and authentic assessments, including play-based tools and digital games, foster engagement and make learning feel meaningful for students.[36]

- **Alternative Assessments** - Alternative assessments are performance-based ways of measuring abilities and knowledge, as opposed to traditional assessments in which students recite information or select correct answers from a list of options. Alternative assessments include a range of performance-based activities, such as: presentations, re-enactments, simulations and role-playing, and other projects. Alternative assessments are often more inclusive because they do not necessarily privilege students from specific backgrounds and with specific, traditionally rewarded skillsets.

- **Authentic Assessments** - Authentic assessments (and learning experiences more broadly), in which students participate in real-world situations and are evaluated based upon real-world criteria, can help make learning feel meaningful, relevant, and purposeful to students.

- **Games as Assessments** - Digital games, especially role-playing, strategy, and sandbox games, provide rich environments for student engagement as well as opportunities for alternative and authentic assessment. *Coupled with debriefing and reflecting* upon game experiences, SEL and academic skills learned in games can be transferred and applied to other domains.[37, 38]

DEVELOPER SPOTLIGHT

Centervention
Focus on fun, because fun works.

Design tools that use alternative and authentic assessments to support and measure learning.

INDUSTRY EXAMPLE

Centervention is a web-based game to support development of SEL skills like self-regulation for younger students who may be struggling with these areas. In addition to providing an enjoyable environment for students, the tool serves as an assessment of student understanding and ability in various SEL skills without the high stakes of a traditional test, ensuring that students are measured more accurately and in a way that they find enjoyable.

Lever 3. Inclusivity

Inclusivity in an educational setting means ensuring that all learners are considered, supported, and welcomed.

Finding 1. Avoid bias and demonstrate sensitivity in materials.

Educational materials often unknowingly embed bias and show a lack of sensitivity toward minority students. Inclusivity, at every level, is essential for healthy school culture and climate.

- Unconscious bias (sometimes called "implicit bias") contributes to differences in how students of different racial and ethnic backgrounds are treated. These effects are sometimes subtle and difficult to notice, but they can be profound. Unconscious bias can be challenging to recognize, acknowledge, and overcome, but doing so is a key step in improving equity in educational settings.[39] Unconscious biases may occur not only in teaching practices or administrative decisions, but also in curriculum, technology design, and policy creation.

- Curriculum and pedagogy should be culturally relevant and culturally sustaining.[40] Because of systemic inequalities and cultural complexities, educational materials and teachers benefit from explicit engagement with issues of justice and equity.

- Assessment is an area where both explicit and implicit biases, as well as lack of sensitivity to differences, can have especially large impacts on students. Assessments that don't take into account differences may fail to measure what they intend to measure. For example, despite understanding the actual material being assessed, students may struggle on assessments that rely on the ability to see certain colors, hear certain pitches, decode certain languages or idioms, or understand certain cultural conventions. The *Smarter Balanced Assessment Consortium's Usability, Accessibility, and Accommodations Guidelines*[41] detail several considerations as they relate to ESSA assessments.

DEVELOPER SPOTLIGHT

Carefully evaluate your tool and materials and for potential biases, and redesign for inclusivity where needed.

INDUSTRY EXAMPLE

Amira is an AI tool designed to help young students learn to read using modern speech recognition to check for reading mistakes and provide real-time feedback on algorithmically-selected texts. Amira is careful to calibrate its recognition software to individual students to prevent bias and account for regional and cultural differences in pronunciation and accent. Using Amira, students receive bias-free oral reading assessment scores.

Finding 2. Amplify inclusivity with Universal Design for Learning.

The Universal Design for Learning *Guidelines* articulate conditions for teaching and learning that promote equitable access to learning experiences for all students.

- Educational materials should take into account the range of students who might encounter those materials. "Universal Design for Learning" is an important way to think about meeting the needs of students from diverse linguistic, cultural, and socioeconomic backgrounds and with diverse abilities, including those with learning differences and physical disabilities.[42]

- The Universal Design for Learning Guidelines (see Figure 11)[43] present "check points" for three main principles: engagement, representation, and action and expression.

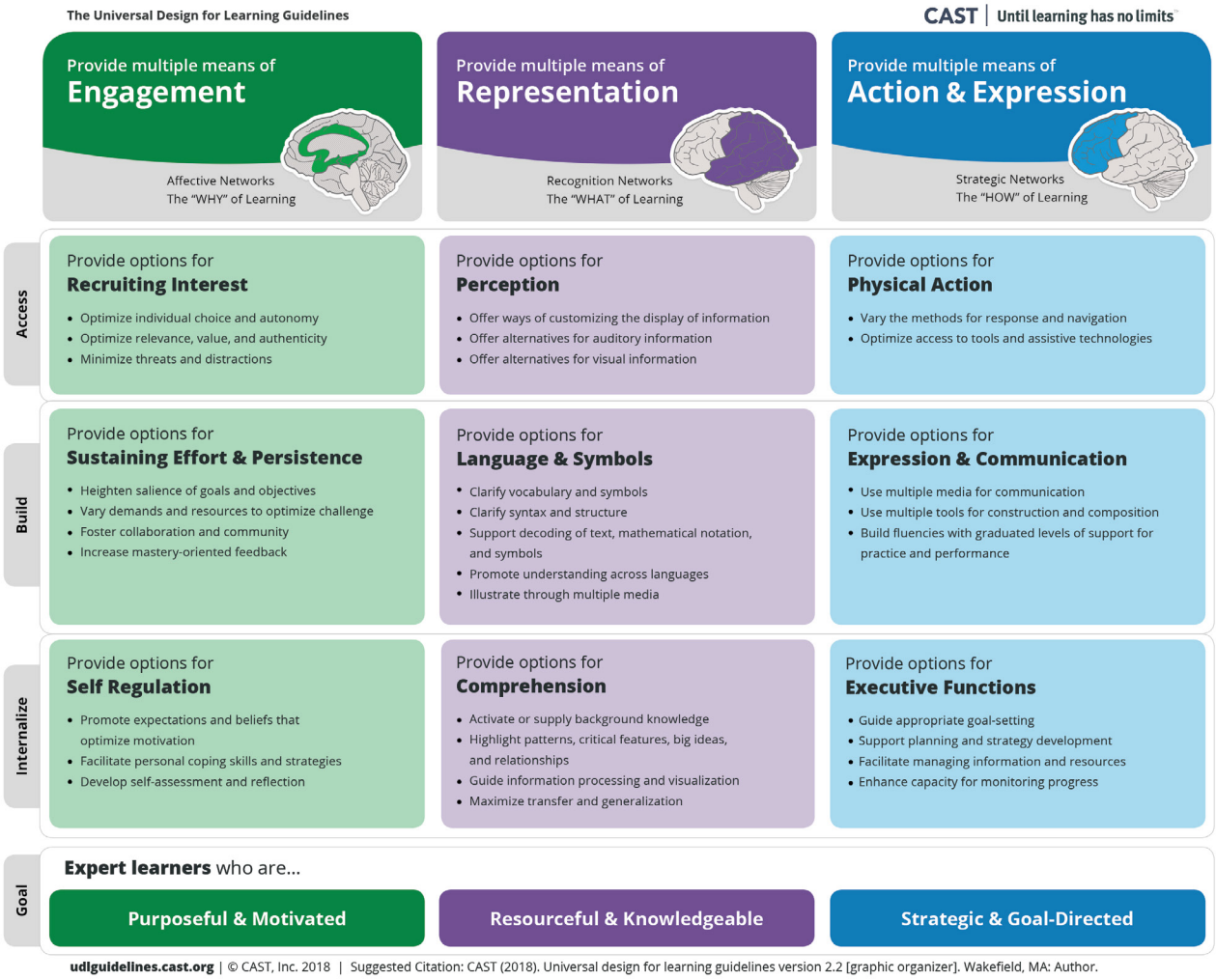


Figure 11. Universal Design for Learning Guidelines

DEVELOPER SPOTLIGHT

SOWN TO GROW

To ensure usability for all learners, consult the UDL framework.

INDUSTRY EXAMPLE

Sown to Grow is a student-centered tool for goal setting, progress tracking, and reflection. Sown to Grow has a well-designed, easy-to-use interface that effectively engages students and meets the needs of a wide range of learners, exemplifying all three principles of the UDL. Students log into the platform and record their performance on assessments, how they feel about how they did, and what strategies they used or can use in the future. They can monitor their performance, their reactions, and their strategies over time to see what is and isn't working for them, as well as building the metacognitive skill of reflecting upon their learning process.

CONCLUSION

EDSS represents an expansion beyond the conception of success as a set of narrow academic indicators. The growing movement to include social emotional development and school culture and climate in the definition of success is fueled by recent changes to education policy at the national, state, and local levels. As stakeholders grapple to figure out the best ways to measure and support these new domains, there is an opportunity for EdTech developers to begin meeting growing stakeholder needs.

Because measurement of success beyond academics is linked to funding, the need at the state and district level is urgent. As is typical for education, these pressures have begun to trickle down to schools and classrooms as well. Administrators and teachers sense the growing need for new tools, strategies and programs that support social emotional development and school classroom and culture. While this is true, many lack either the time or background knowledge required to develop what they need on the ground. The time for innovation is now, innovation that is grounded in research and informed by collaboration with educational stakeholders.

Although several EdTech companies have begun to lay roots in the EDSS marketplace, these are still the early days for this movement. There are many aspects of social emotional development and school culture and climate that could benefit for supportive digital tools yet are still untouched or unsatisfied by the EdTech industry. Yet schools, districts, and states need highly effective tools now. While there is not substantial research on what is currently working at the intersection of EdTech and EDSS yet, there is substantial research that is applicable to EDSS that can be leveraged for the evaluation and design of new tools that will meet the growing demands of educators and education leaders. The levers and findings identified in this report are intended to support an increase in research-based innovation in order to provide new tools to education stakeholders that are designed for change with efficacy in mind.

APPENDIX A.

Methodology

Research on EdTech typically lags significantly behind the current interests and needs of the market. This is because funding and publication cycles for academic research are extremely slow as compared to the rate of innovation in the field. Despite this, there is a significant amount of relevant research about social emotional development and school culture and climate that is not directly about EdTech but still applicable to the evaluation, development, and implementation of EdTech tools intended to support student success on new fronts.

This review takes into account over 100 books, literature reviews, meta-analyses, research articles, and white papers from 20 different academic fields. The methodology for identifying, selecting, and synthesizing these sources is detailed on the coming pages.

Research Questions

The following questions were used to guide the research and analysis presented in this report:

Social Emotional Development - What key levers support the development of social emotional competencies, skills, and mindsets by K-12 students?

Culture and Climate - What are the key levers for developing a healthy school culture and climate in K-12 schools?

Literature Search and Review

To answer these questions, MBZ Labs approached the identification, review, and analysis of relevant research using a four-phase process.

Phase 1 - Defining the Scope. MBZ Labs identified more than 20 academic fields from the learning sciences, psychology, and education literatures (i.e. neuroscience, character education, positive psychology, mindset research, emotional intelligence) that regularly publish research related to social emotional development and school climate and culture.

Phase 2 - Database Search. To identify specific articles, we searched academic databases and Google Scholar for articles using combinations of field names, keywords, and prominent scholar names from each field.

Phase 3 – Reference Mining. To assure a rigorous review, we identified additional relevant works by mining the reference lists from the articles yielded during the previous phase. We mined these lists to identify and corroborate existing entries on our growing list of references that were widely cited, field defining, reviews that consolidated years' worth of findings, or articulated introducing key frameworks.

Phase 4 – Review, Analyze, and Synthesize. In total, the MBZ Labs research team read over 100 books, literature reviews, meta-analyses, research articles, and white papers. During the review process, we identified key findings from seminal works, noting these in team research memos. After reviewing the complete literature collection, the team organized key findings by theme noting their frequency, their uptake in other works, whether they were contested in other research, and their relevance for EdTech developers. While no one article tells the entire story, when taken together a set of critical insights emerged.

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ABOUT

MBZ Labs

MBZ Labs is an independent research organization that helps clients understand, achieve, and sustain their visions for teaching and learning. MBZ Labs answers critical efficacy questions for edtech companies, funders, and organizations as they strive to understand whether, how and why EdTech products and programs are working as intended. Their suite of research capabilities is designed to build background for clients, and to condense learning sciences and educational research into succinct, actionable insights. These insights enable clients to efficiently understand research, and to apply that understanding to inform product and business development strategies. MBZ Labs also conducts independent research that allows clients to understand and communicate about the efficacy of their educational products and programs in a way that is research based, authentic and relevant in our fast-evolving world. To learn more, visit: mbzlabs.com. Find us on Twitter @MBZLabs

New Schools Venture Fund

NewSchools Venture Fund is a not-for-profit organization working to close the achievement gap by funding and supporting entrepreneurs who are creating innovative solutions to the problems in public education so that all children have the opportunity to succeed in college and beyond.

END NOTES

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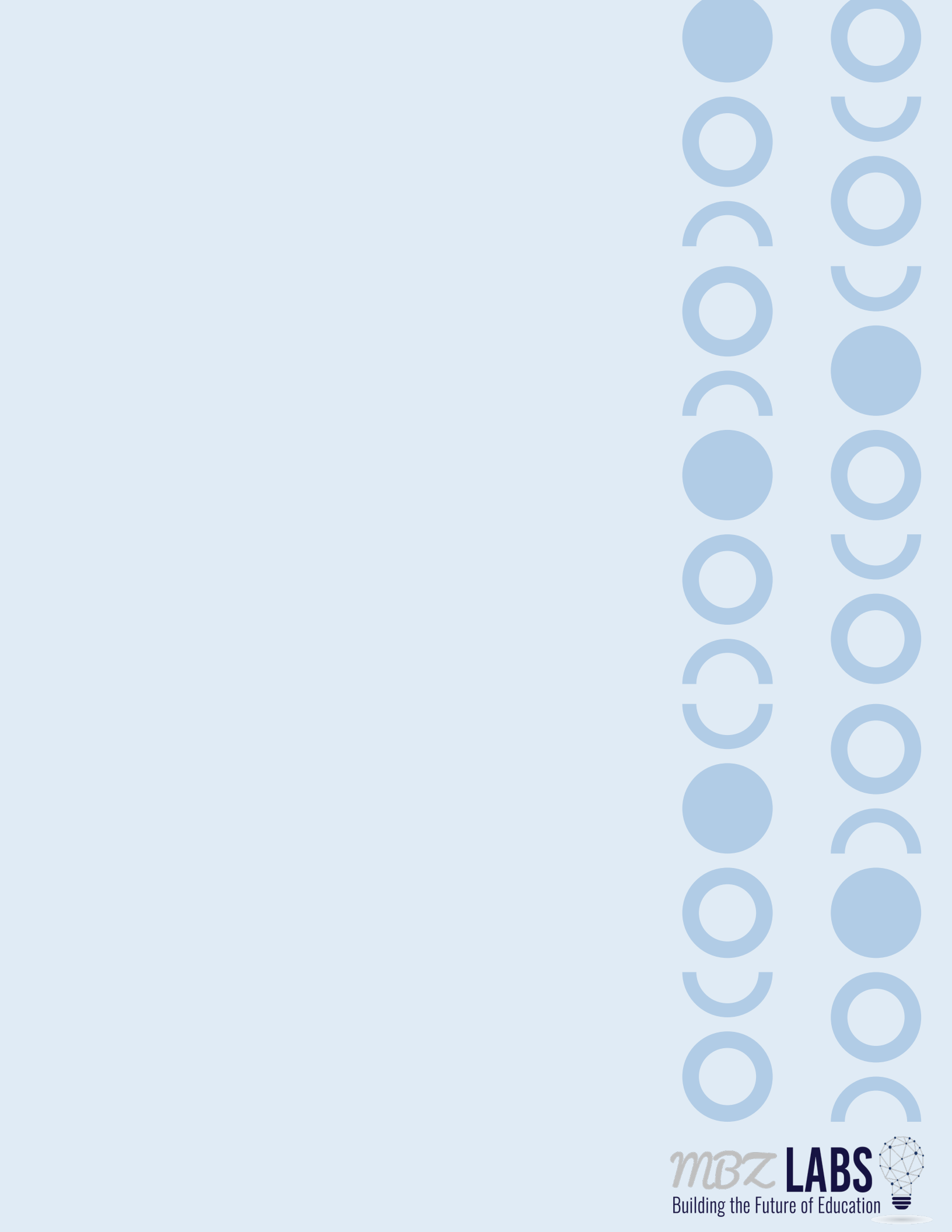
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