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Abstract

Systemic change is far more difficult than piecemeal reforms because it requires far more interrelated and interdependent sets of changes to occur. Systemic change has two potential areas of failure: 1) the change process (**action**) may never reach full implementation of the new system, and 2) the new system (**vision**) may not be well designed. This paper describes Reigeluth and Karnopp's (2020) compilation of a growing body of research-based knowledge about systemic change in education that includes both sides of the coin: 1) the vision, for which they describe 25 principles organized into six core ideas, and 2) the action by which the vision is created and implemented. The action knowledge base includes guidance about values, principles, and both sequential and continuous activities. The sequential activities are different for a school district than for an independent school. We define "independent school" as one that is not part of a district or other organization but may be a public school.

Keywords Collaborative learning · Competency-based education · Organizational structures · Personalized learning · Project-based learning · Self-directed learning · Student choice · Systemic change process · Paradigm change process

Systemic change is far more difficult than piecemeal reforms because it requires far more interrelated and interdependent sets of changes to occur. Systemic change has two potential areas of failure: 1) the change process (**action**) may never reach full implementation of the new system, and 2) the new system (**vision**) may not be well designed. Therefore, a body of knowledge about systemic change in education must address both sides of the coin: 1) the vision and 2) the action by which the vision is created and implemented. This paper describes the current state of knowledge regarding these two parts of a body of knowledge about systemic change in education, based on an extensive review by Reigeluth and Karnopp (2020).

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The Vision

Reigeluth and Karnopp (2020) identified 25 principles for the design of the personalized, competency-based, learner-centered paradigm of education for preK-12 schools, though most of the principles apply in higher-education and corporate settings as well. These principles were derived from (1) an extensive review of the literature about the educational needs and tools of a digital, post-industrial society, (2) studies of schools that have transformed to the new paradigm, and (3) the experience of the authors in founding and leading such a school (Karnopp) and transforming existing schools (Reigeluth). The principles are highly systemically interdependent but incompatible with most features of teacher-centered schools, thus requiring paradigm change. Because of their interdependence, systems thinking is crucial for (re)designing a school system to meet the educational needs and tools of a digital, post-industrial society. These 25 principles are organized under six core ideas that inform the creation of a vision to better meet students' and communities' needs: competency-based education, learner-centered instruction, restructured curriculum, new roles, a nurturing culture, and new organizational structures (see Table 1).

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Table 1 Six Core Ideas and 25 Principles for the Vision

Core Ideas	Principles
1. Competency-Based Education	A. Competency-based student progress
	B. Competency-based student assessment
	C. Competency-based learning targets
	D. Competency-based student records
2. Learner-Centered Instruction	E. Learning by doing
	F. Instructional support
	G. Personalized learning
	H. Collaborative learning
3. Restructured Curriculum	I. Relevance to students' current and future lives
	J. Whole-child education
	K. Balance of universal content and individual strengths
	L. Sound progressions in content
4. New Roles	M. Teacher as guide
	N. Self-directed student
	O. Parent as partner
	P. Technology as tool for students
5. A Nurturing Culture	Q. Strong and caring relationships
	R. Multi-year mentoring and multi-age grouping
	S. Motivational learning
	T. Family services
6. New Organizational Structures	U. Small school size
	V. Professional organizational structure
	W. Student choice, incentives, and accountability
	X. Administrative structures
	Y. Governance structures

Competency-Based Education

Competency-based education (CBE) can be done well or poorly – partially or wholly. It is a system whose parts must be aligned for it to work well. Its major parts include learning targets, student assessments, student progress, and student records. These constitute the four principles of the core idea of CBE.

A. Competency-Based Learning Targets To know when each student has learned the current material, the teachers have to define the content in the form of learning targets – individual competencies – which are more detailed than typical state and national standards. Also, a learning target can have different levels of mastery, which constitute a proficiency scale (Marzano 2010). To avoid fragmentation, learning by doing (principle E) places the learning targets within a holistic, meaningful context.

B. Competency-Based Student Assessments Central to CBE is knowing when each student has mastered the current material. Hence, it requires a different paradigm of assessment—criterion-referenced assessment—which compares student performance to a standard (or criterion), rather than comparing students to each other (norm-referenced assessment) (Gallagher 2003; Marzano 2006). This is a different paradigm of assessment.

C. Competency-Based Student Progress In a competency-based system, students move on when they have learned and can demonstrate the understandings or skills (Bloom 1984). If it's important to teach, we should make sure students learn it. Thus, no student moves on *before* mastering the current topic, and each student moves on *as soon as* he or she masters the current topic. Student progress is based on learning regardless of time, rather than time regardless of learning. This greatly improves learning outcomes (Kulik et al. 1990).

D. Competency-Based Student Records To make decisions about what a student should learn next, one must know what the student has already learned. Current student records only tell you the courses the student attended and grades that tell you how well the student performed compared to other students. What is needed instead is a list of individual learning

targets that the student has mastered, often accompanied by a portfolio, rubric assessment, or other proof of mastery, sometimes called a digital backpack. At Sanborn High School in Kingston, NH, all courses use a competency-based grading and student record system (New Hampshire Department of Education n.d.). Badges are one form of keeping a record of student competencies.

If CBE is not designed using all four of these principles, it will not be very successful. But successful CBE requires additional principles as well.

Learner-Centered Instruction

Learner-centered instruction (LCI) is crucial to the success of CBE, and it also has four major parts that must be aligned for it to work well: learning-by doing, instructional support, personalized learning, and collaborative learning.

E. Learning by Doing (Project-, Problem-, Inquiry-, Task-, and Maker-Based Learning) Generally, the most effective way to learn is by doing, especially for younger students (American Psychological Association Presidential Task Force on Psychology in Education 1993; Bransford et al. 2000; Freeman et al. 2014; National Academies of Sciences, Engineering,, and Medicine 2018; Newman 2003; Preeti et al. 2013; Schank et al. 1999; Strobel and van Barneveld 2009; Vega 2012; Walker and Leary 2009). We collectively refer to all forms of learning by doing as *project-based instruction*, which enhances motivation, retention, and transfer to the real world. In project-based instruction, each student chooses or designs a project as a vehicle to master specific content. Projects are typically collaborative, interdisciplinary, of significant scope, and as students grow older, focused on bettering the student's world, not just the student (Prensky 2016; Wagner 2012).

F. Instructional Support Just-in-Time during Projects Instructional support, sometimes called scaffolding, accelerates learning and helps all students reach their potential (Kirschner et al. 2006). It can take the form of adjusting, coaching, or tutoring. *Adjusting* entails tailoring the complexity or difficulty of the project to the level of the student. *Coaching* includes giving suggestions or hints to the student while the student is performing. *Tutoring* involves teaching the student a competency, preferably just before it is needed in a project, with the goal of applying it to the project in sight, to enhance motivation.

G. Personalized Learning (Personalized Goals, Projects, Instructional Support, Assessment, and Reflection) To accelerate learning and help all students reach their potential, it is essential to customize the learning experience (Hannover Research 2015). Personalized instruction does *not* mean that students must learn alone. In fact, teacher guidance and collaborative project-based learning are common parts of personalized CBE. A good way to personalize the instruction is to help each student make good choices in all the following areas: goals, projects, scaffolding, assessments, and reflections (Watson and Watson 2017). Each student should have a personal learning plan developed by students in collaboration with teachers and parents (Great Schools Partnership 2014).

H. Collaborative Learning (in both Team-Based and Individual Projects) Collaboration is increasingly important in work environments. Collaborating in the school environment helps prepare students for that. Other benefits are that the helper learns too, it builds community and interpersonal skills, it enhances motivation, it develops critical thinking, and it frees up teacher time to work on cultivating other aspects of student development (Gokhale 1995). Collaboration can take the form of peer assistance on one-student projects or deeper collaboration on team-based projects.

These four principles work in sync with each other to improve student motivation and learning. Omitting any one of them will hurt learning. And these four principles greatly enhance the effectiveness of CBE.

Restructured Curriculum

This is a different and somewhat independent aspect of the new paradigm of education for meeting the educational needs of the information age (or digital age). Dramatic changes in society have been brought about by digital technologies, and they require big changes in what needs to be taught. In addition, the change to learner-centered instruction requires the curriculum to be more motivational. Hence, a restructured curriculum should: be focused on relevance to students' current and future lives, address all aspects of child development, provide a balance of "universal" content and cultivation of individual strengths and talents, and entail sound progressions in content.

I. Focused on Relevance to Students' Lives The most important criterion for deciding what students learn should be relevance to students' current and future lives—what they need to learn to become happy, healthy, caring, successful adults who contribute to their communities in an unpredictable, increasingly high-tech future (Collins 2017; Lash and Belfiore 2017; Partnership for 21st Century Skills n.d.; Perkins 2014; Prensky 2016; Wagner 2012; Watkins et al. 2018). The curriculum should focus (a) on helping each student find their passion and cultivate their individual talents to pursue that passion and (b) on making the world a better place (Prensky 2016; Wagner 2012). This principle greatly enhances student motivation, which is essential for LCI.

J. Whole-Child Education There is strong evidence that students benefit greatly from education that addresses all aspects of human development: social, emotional, identity, physical, psychological, and ethical, as well as cognitive (Durlak et al. 2011; Mahoney et al. 2018; Rebora 2018). In an age when religion plays a diminished role in children's lives, whole-child education is increasingly important.

K. Balance of "Universal" Content and Cultivation of Individual Strengths/Talents There is some content that all students should learn: some basic skills, many higher-order thinking skills, self-direction skills, interpersonal skills, emotional development, civic skills and understandings, parenting skills, some character traits, and more. We call this *universal content*. In addition, a considerable amount of each student's learning time should be devoted to cultivating each student's individual strengths, interests, and talents. This better prepares each student for a productive and successful life. But it also better meets the needs of society, given the dramatic increase in the number of different kinds of careers requiring different kinds of talents. A standardized curriculum intended to ensure that all students leave with the same skills is counterproductive to society's needs in this age of ever-growing complexity and diversity.

L. Sound Progressions in Content Whatever content you select, your team should organize it around sound progressions, so that learning is neither too difficult nor too easy for each student. Reigeluth and Karnopp (2020) offer methods for helping to design such progressions.

New Roles

To be implemented effectively without overburdening the teacher, CBE and LCI require new roles for the teacher, student, parent, and technology.

M. Teacher as Guide on the Side The teacher's role must change dramatically to effectively implement CBE and LCI. Your team should consider the following five roles for teachers: mentor, designer (or curator), facilitator, collaborator and consultor, and learner (Reigeluth and Karnopp 2020).

N. Student as Self-Directed Learner Lifelong learning is becoming essential as the pace of change continues to accelerate in the post-industrial era and career change is more frequent. Teachers should help students to develop agency by giving them voice and choice, helping them develop goals that better their world, and helping them learn how to self-regulate effectively (Miliband 2006; Schunk 1991). Self-direction skills, responsibility, and empowerment are key.

O. Parent as Partner Parents and other primary guardians are children's first and most important teachers. Students will be better off to the extent that parents are effective partners with teachers in their child's learning and development, especially at lower age levels.

P. Technology as Tool for Students Technology can ease the burdens of CBE and LCI on teachers by being primarily a tool for students, rather than primarily for teachers. To support student learning, technology must serve four major functions:

1. planning for student learning (creating a personal learning plan for each student),
2. instruction for student learning (providing realistic project environments and just-in-time instructional support),
3. assessment for/of student learning (certifying when each competency has been mastered),
   and
4. record keeping for student learning (keeping track of competencies mastered by each student) (Reigeluth et al. 2015).

All four of these functions should be integrated into one platform that automatically transfers data from one function to another, greatly reducing the burden on each teacher. And this integrated tool should provide information to parents in an easy-to-use format. These roles greatly improve the effectiveness of CBE and LCI.

A Nurturing Culture

A curriculum focused on whole-child development benefits greatly from a nurturing school environment. Four principles contribute to such an environment: strong caring relationships, multi-year and multi-age grouping, motivational learning experiences, and family services.

Q. Cultivation of Strong and Caring Relationships Caring relationships between teachers and their students and among their students are important to healthy child development (Battistich et al. 1997; Osher et al. 2018). They promote social, emotional, ethical, and character development, as well as cognitive development, and they reduce negative behaviors such as bullying, clique formation, discrimination, drug use and reactive decision-making that escalates into violence. Caring relationships are promoted by small school size (see principle U), by classroom culture, climate, and procedures, by the nature and frequency of interactions, and by multi-year mentoring.

R. Multi-Year Mentoring and Multi-Age Grouping Since students learn at a pace that suits their learning needs (Principle C), grade levels become arbitrary labels. It makes more sense to organize the students into developmental levels that span

multiple ages and include consideration of social, emotional, and cognitive development. Students stay with the same mentor teacher for a developmental stage of their lives, which typically last three to five years (Edwards 2006). This way, students get to know each other well and with a majority of students remaining in the same "classroom" each new school year, the classroom culture does not have to be recreated each year. Also, when older students are given the role of mentor for younger students, they assume more responsibility, and younger students try to live up to the example set by the older ones.

S. Motivational Learning Experiences When students are engaged and excited by their learning tasks, they learn faster and better, there are fewer discipline problems, and the relationship between student and teacher is strengthened (Pane et al. 2017). Powerful tools for motivational learning include passion-based learning, purpose-based learning or goal orientation, and strategies related to McClelland's (1987) needs for achievement (addressed by competency-based education), affiliation (addressed by cooperative learning), and power (addressed by self-directed learning.

T. Family Services An important part of a nurturing culture is that families are valued and supported. Furthermore, they can help the teacher, and the teacher can help them. Teachers can help the parents to support their child's learning at home and on trips. And parents increasingly need a reliable source of information and advice about raising their child and dealing with behavior problems – someone to turn to with questions about parenting, health services, specific social challenges, and much more. Also, schools have a vested interest in helping families, for without such help, most students cannot reach their potential. Community schools and school-community centers are powerful approaches to meeting these needs (Jacobson et al. 2018; Ringers and Decker 1995).

New Organizational Structures

The final core idea relates to organizational structures that promote a nurturing culture, teacher professionalism, better incentives and accountability, and simultaneously reduce costly bureaucratic structures.

U. Small School Size Small school size has many advantages: it promotes a nurturing culture, which mitigates student alienation and promotes understanding across race and other differences among people. It also tends to be less bureaucratic, makes it easier for teachers to have a strong voice in running their school, and empowers students and teachers. While small schools can have some disadvantages, Reigeluth and Karnopp (2020) offer several ways these can be mitigated.

V. Professional Organizational Structure – Teachers "Own" their Public Schools We call teaching a profession, but we do not treat teachers as professionals. Other professionals, like architects, accountants, and lawyers, often work in partnerships in which they control their work, including all managerial decisions. The professionals are not only responsible for serving the best interests of their clients, but are empowered to do so. Schools could be organized the same way. In fact, there are already over 100 such "teacher-powered" schools in 17 states. So how are these teachers and schools held accountable? In a manner similar to the way architects and accountants are (see Principle W).

W. Student Choice, Incentives, and Accountability The current bureaucratic accountability system with its high-stakes tests severely constrains flexibility and innovation, and it is expensive. Based on how other professionals are held accountable, Reigeluth and Karnopp (2020) propose a choice-based accountability system where students choose among many small public schools, and the public funds follow the student. This system is designed carefully in such a way as to achieve greater equity than the current system and prevent the choice from being just a popularity contest.

X. Administrative Structures that Support Rather than Control the Teachers To support the principle of teacher-powered schools, the districtwide administrative system plays a servant role rather than a command-and-control role with its schools, for most of its budget comes from the schools it serves. It serves as landlord for the schools, charging them rent for their facilities, and it is contracted by each school to provide support services (accounting, purchasing, janitorial, etc.).

Y. Governance Structures that Empower the Teacher-Led Schools The choice-based decision-making and accountability system changes the role of the school board to more like a regulatory agency. It sets and monitors the attainment of community standards (learning outcomes) much like a chartering organization does now, and it establishes and enforces a small number of policies and regulations that promote racial and economic diversity, excellence, and other equity-focused values.

These four principles are highly interdependent. Teacher-powered schools become unmanageable unless they are small schools, and they require administrative and governance structures that empower and support, rather than control. This requires the bureaucratic accountability system to be replaced by a choice-based system. And teacher empowerment greatly facilitates innovation and flexibility, which are important for allowing schools to adapt more quickly to changing educational needs and tools in our rapidly changing post-industrial age.

Based on an understanding of systemic interdependences among these 25 principles, it should be apparent that

implementing these principles one at a time over a period of years would be akin to trying to transform a railroad into an airline by changing one part of the railroad at a time. It just wouldn't fly. So how can schools change to this new paradigm of education?

The Action

Reigeluth and Karnopp (2020) also developed guidance to enhance the success of one's process for customizing, and transforming to, the kind of vision represented by these 25 principles. This guidance is based on an extensive review of systemic change processes for organizational transformation and the first author's experience facilitating an 11-year transformation process in the Indianapolis Metropolitan School District of Decatur Township. This guidance takes the form of a set of values (what people *feel* is important), principles (what works *empirically*), and activities (what can be *done* that has proven effective) to create and implement a viable vision that will better meet today's and tomorrow's educational needs. The activities include ones that should be done in a sequence (phases and steps, like forming a team) and ones that should be done continuously throughout the process (like building and maintaining motivation for change). Reigeluth and Karnopp (2020) also recommend that each design team customizes the values and activities to its unique situation.

The framework in Fig. 1 shows that values are the foundation for the whole change process. The principles are based on the values but are also based on evidence. The principles guide both the sequential and continuous activities.

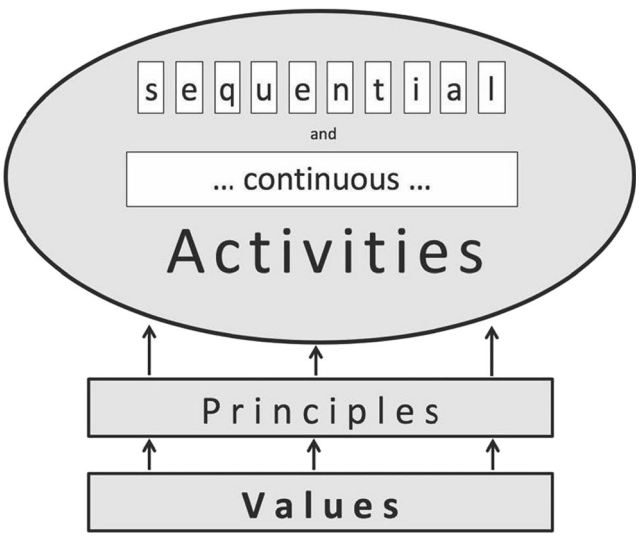

Fig. 1 A framework for fundamental change (from Reigeluth and Karnopp 2020)

Values

We strongly encourage your team to reach consensus on the values that you want to be the foundation for your change process. Reigeluth and Karnopp (2020) suggest that the values include:

- Putting students first in all decisions
- Improving the quality of life for the adults who work in schools
- Creating healthy relationships between a school system and its community
- Building a shared vision among all stakeholder groups and empowering them
- Exemplifying group-action values, such as collaboration, consensus-building, systems thinking, dialogue, team learning, and social responsibility as tools for change in mental models or mindsets
- Exemplifying personal-action values, such as full disclosure of concerns, trust, respect, responsibility, commitment, self-criticality, and flexibility
- Understanding societal evolution and the need for co-evolution with educational systems
- Building readiness and capacity for change.

Principles

The following principles have been found to enhance the success of a systemic change process (Reigeluth and Karnopp 2020):

- Change in mental models is the most important outcome of the transformation process – it must be a learning process.
- Broad stakeholder involvement and ownership are key to a successful process.
- Process is more important than product because it brings about changes in the people involved.
- The process should entail consensus-building rather than majority rule
- The process should build and utilize participatory leadership (servant leadership)
- The process should have strong leadership and political support.
- Capacity building and readiness are crucial to a successful process.
- The culture should be characterized by empowerment, inclusion, collaboration, consensus orientation, systems thinking, trust, disclosure, and the norm of not blaming people.
- Stakeholders must think in the ideal about what their educational system should be like, and the process should be

an invention process more than a decision-making process.
- High-leverage changes should be made first, then the remaining changes should emerge as the system develops
- The design of PCBE must begin with the learning experiences, and then the instructional system, followed by the administrative system, and finally the governance system.

Continuous Activities

These activities address ongoing needs that the change team should monitor throughout the change effort and address whenever they fall below a critical threshold (Reigeluth and Karnopp 2020).

- Evaluate and reflect on the process
- Build and maintain trust
- Evolve mental models and culture
- Sustain motivation
- Develop systems thinking and design skills
- Develop and sustain appropriate leadership
- Communicate interactively with stakeholders
- Secure and allocate necessary resources
- Develop group-process and team-building skills
- Engage in self-disclosure
- Build and evolve a sense of community
- Foster organizational learning and memory

Sequential Activities

The sequential activities depend on the scope of your change effort: a ***single school*** or a ***school district*** (Reigeluth and Karnopp 2020). Transformation of a single school *within* a district is not sustainable because it will be incompatible with the rest of the district. Therefore, the single-school process should only be used in a school that operates independently, such as many charter schools and private schools.

Single School

The following is a brief summary of the four phases of the sequential activities for a single school (Reigeluth and Karnopp 2020).

1. **Prepare for the change process.** First initiate the change process, which entails selecting a process facilitator, ensuring sufficient school readiness, and ensuring leadership support and understanding. Then form a prelaunch team, develop its culture and capacity, and develop school capacity, including securing funding and selecting an assistant principal for transformation.
2. **Create a shared ideal vision, expand capacity, and develop a strategy for change.** First, the prelaunch team expands into a school leadership team that includes leaders of all stakeholder groups in the school to lead this activity. Each leader engages others in their stakeholder group (akin to pyramid groups), to share and evolve thinking and seek input to the vision. During this time, the leadership team develops the school's *capacity* for change. Next, the leadership team develops a *strategy* for the implementation approach (whole-building or school-within-a-building) and decides which grade levels to transform in the first year of implementation. Then the leadership team decides on ways that the ideal needs to be *scaled back* for the initial implementation of PCBE in the school, taking into account the need to make sufficient *high-leverage changes* right away. Finally, they decide how many and which teachers will transform in this first iteration, and those teachers are formed into *task forces* that prepare *detailed designs* for the initial studios (classrooms) on each of the selected grade levels.
3. **Implement the vision.** Time and money are allocated to procure necessary resources, finding or designing projects and other activities for students, engaging teachers in professional development, and remodeling facilities. This is also the time to recruit students (if needed) and hold a ***student orientation*** to prepare them for their new roles. A ***parent orientation*** is also held. Then the school implements high-leverage changes for its vision and makes other changes as the need emerges. Leaders continuously ***evaluate and improve*** the new system. Finally, additional teachers are recruited each year and task forces are formed to ***expand the implementation*** to other classrooms on the same grade levels, as well as to the next-higher grade level.
4. **Evolve the implementation:** The school makes additional changes as needed or desired in order to support the high-leverage changes. Formative evaluation is key. Eventually, the school forms a new leadership team to develop and evolve toward a new ideal vision.

School District

The following is a brief summary of eight phases for the sequential activities in a **district-level** systemic change process (Reigeluth and Karnopp 2020).

1. **Prepare for the change process.** Preparing a school district for paradigm change is critical to successful implementation of PCBE. It is important to partner with an experienced external process facilitator, marshal political support, form a small prelaunch team (of seven or eight people) that includes leaders from the major stakeholder

groups, and enhance district capacity for paradigm change.

2. **Create a shared ideal district vision and develop capacity and a strategy for change.** Developing a shared vision of PCBE promotes learning, mindset change, and commitment to change, and it reduces resistance to change. The prelaunch team expands into a ***district leadership team*** (roughly 30 people), which includes leaders of all stakeholder groups in the district. Each member of the leadership team engages others in their stakeholder group to get input from them and help those stakeholders' thinking evolve along with the leadership team members'. In this way, stakeholders' mindsets shift towards the PCBE paradigm as the district leadership team's vision begins to crystalize. During this time, the district leadership team also develops the district's ***capacity for change.*** This primarily entails cultivating a culture for change, developing the change process skills of participants, and procuring resources for the process. The district will soon need funding to visit other PCBE districts and schools, provide professional development for teachers, remodel facilities, and procure tools and materials for PCBE. Finally, the district leadership team develops ***a strategy for implementing the vision*****,** typically involving decisions about the number of schools (one "feeder system" versus all the schools) and the number of teachers in each school (one "school within the school" versus the entire school).
3. **Choose a school or schools to pioneer PCBE.** The district leadership team solicits applications for schools to pioneer PCBE and selects the one (or more if enough resources are available) that demonstrates the ***highest level of readiness***—not the one with the greatest need. The district leadership team also helps other schools to improve their readiness for change.
4. **Create a shared ideal school vision.** Leaders of all stakeholder groups in the chosen school(s) form a ***school leadership team*** to participate in this phase. Each leader engages others in his or her stakeholder group so that the thinking of those others evolves with their leader's and so that they can provide input through their leader. The vision must be consistent with the district vision but could do so in different ways from other schools that are transforming in the district.
5. **Create a separate district administrative structure.** The district leadership team designs and implements a separate administrative structure (akin to that described in principle X earlier) to support the transformed school(s). A separate administrative structure is essential, because many aspects of the current administrative structure are ***incompatible*** with PCBE but remain important for the schools that have not yet transformed. This new administrative structure obtains any needed waivers for the PCBE school(s) from the state education agency.
6. **Implement and evolve the school vision.** The chosen school implements ***high-leverage changes*** in its vision and then makes other changes as the need emerges. It is important to allow sufficient time to procure tools (for example, hands-on learning materials, digital tools, online tutorials and assessments), design projects and other activities for students, receive professional development for effective use of tools and design of projects, and possibly remodel facilities (for example, classrooms into studios). If the school is large, there are likely teachers and families who are reluctant to pioneer the changes. One solution is to divide the school into ***two schools within the same building*** and allow both teachers and students to choose. However, this must be done with a commitment that the reluctant group will transform in the future, so they view the pioneers as paving the way for them rather than competing with them. Also, as students advance in grade levels, it becomes progressively harder for them to switch to PCBE, because they become conditioned to be passive learners and lack the self-direction skills and mindsets necessary for success in a PCBE classroom. It would also be frustrating for PCBE students to go back to the teacher-centered system. Therefore, it is wise to first implement PCBE in the ***first three-to-five grades*** (say, ages five to eight) and convert one grade per year thereafter. This progressive approach also helps prevent spreading resources for change too thinly. Finally, the chosen school makes ***additional changes*** as needed or desired in order to make the high-leverage changes work better. Formative evaluation of the PCBE system is crucial. No summative evaluation should be done (or if done, it should be ignored) for about five years, to give time for the evolution to overcome inevitable problems.
7. **Expand to additional schools.** Repeat phases 3, 4, and 6 for a few more schools that are at the highest levels of readiness, helping each to gradually work up to higher grade levels.
8. **Evolve the ideal visions.** Educational needs and tools change over time. After about ten years of expanding and continuously improving the school and district visions, the district and schools should form new leadership teams to develop new ideal visions toward which they can continue to evolve.

Reigeluth and Karnopp (2020) provides considerably more detailed guidance for both the vision and action. Also, since it is helpful for educators to be able to reach out to people experienced in the transformation to this new paradigm of education, they offer a comprehensive list of organizations, updated regularly at www.reigeluth.net/vision-and-action, that can help you with your transformation.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflicts of interest.

Human Animal or Informed Consent The authors declare that there were no human participants or animals, and that no informed consent was required.

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