

Introduction

In 2024, the Virginia Department of Education (VDOE) approved revised Computer Science Standards of Learning (SOL), requiring all school divisions to update and align their curricula for the 2025 academic year. For many systems, such mandates present compliance challenges; however, Patrick County Public Schools (PCPS) viewed this requirement as an opportunity for disruptive innovation. In particular, the district sought to integrate computer science throughout all subjects and use this opportunity as a catalyst for advancing its broader strategic objectives. This essay will highlight PCPS's journey in creating a new Computer Science Curriculum, while recognizing that education in rural contexts requires creative adaptation, resilience, and a willingness to convert external mandates into engines of renewal.

The decision to design a new computer science curriculum was grounded in the principles of distributed leadership developed in Module I. A complete summary of Module I can be found in Appendix I. Bardy (2016) and Goodwin and Cameron (2015) stress that leadership should rest within a single authority but be shared across all levels of the organization. PCPS operationalized this model by involving those closest to the work—teachers, technology specialists, students, and parents—in shaping the new curriculum. Retired educators and former division-level specialists were invited to contribute their expertise, while advisory committees and student focus groups ensured diverse perspectives were represented. This process mirrored Columbia Business School's (2020) emphasis on collective intelligence and reinforced the belief that authentic transformation is most effective when it emerges from collaboration.

The urgency of the mandate necessitated rapid action, and PCPS drew upon lessons from Module II on problem-solving and decision-making. A complete summary of Module II can be found in Appendix II. Conn and McLean (2020) argue that when faced with uncertainty, effective organizations must balance experimentation with discipline. In practice, PCPS could not afford protracted deliberation but instead applied structured decision-making processes to streamline implementation. The framework from Module 2 L04, which emphasised delegating operational decisions to those closest to the issues while maintaining strategic oversight at the leadership level, proved invaluable. This approach echoed De Smet, Hewes, and Weiss's (2020) recommendation to empower employees to make smarter decisions and ensure that the curriculum was delivered within the limited implementation window.

Context and Rationale

PCPS has long recognized the central importance of technology in preparing students for a digital future. The division maintains a 1:1 device initiative, providing iPads for all students in Grades K–2 and Chromebooks for Grades 3–12. Instruction is supported through Google Classroom, the division-wide learning management system, which ensures that students can

consistently access content and assignments while developing digital learning skills. PCPS also invests in cutting-edge instructional technologies, such as the Anatomage Table used in nursing, athletic training, biology, and anatomy courses, and an automated greenhouse table, developed in partnership with a local college, that connects coding to real-world agricultural applications. Career and Technical Education (CTE) offerings further reinforce this emphasis, with courses in Go-Tech, Computer Information Systems, and mechatronics equipping students with workforce-ready skills. Finally, PCPS has expanded enrichment opportunities: since 2024, each elementary school has established a Lego League coding team, and in July 2025, the community-based PC Robotics Team became an official high school program, now supported with coaching stipends and division funding. Together, these initiatives reflect PCPS's commitment to embedding technology as both a tool for learning and a pathway to future careers.

PCPS's decision to create and implement a new computer science curriculum must be understood within the broader context of education in the 2020s. External pressures—technological disruption, global economic change, sustainability concerns, and post-pandemic realities—have combined with internal organizational goals to create urgency and opportunity. The curriculum, therefore, represents a compliance measure with VDOE standards and a forward-looking initiative designed to strengthen the district's resilience and competitiveness.

PESTEL Analysis: External Drivers

A structured review of the external environment highlights the multiplicity of factors influencing the development of the Computer Science curriculum. Makos (2024) notes that PESTEL analysis is a critical tool for understanding the political, economic, social, technological, legal, and environmental forces shaping strategy.

- **Political and Legal:** The adoption of the 2024 SOL mandated the integration of computer science across K–12. Compliance was not optional, but the interpretation and implementation of the standards provided scope for innovation.
- **Economic:** As a rural district, PCPS faces challenges of limited resources and funding competition. At the same time, the local economy increasingly demands digital skills. Galvin and LaBerge (2021) argue that digital capabilities are a primary driver of competitiveness in a post-pandemic world. For PCPS, equipping students with these skills is an educational priority and an economic necessity.
- **Social:** Rural students often have less access to technology-rich environments, creating inequities in digital literacy compared to peers in urban and suburban areas. Addressing this divide is central to ensuring equity and inclusion, consistent with Epstein et al.'s (2019) emphasis on schools fostering strong family and community partnerships to

expand opportunity.

- **Technological:** Advances in artificial intelligence, automation, and data analytics are reshaping the workforce. Reeves (2024) highlights that organizations must adopt adaptive strategies to keep pace with technological change. By embedding computer science throughout the curriculum, PCPS prepares students to engage with these technologies as active participants rather than passive consumers.
- **Environmental:** Environmental factors are less directly linked to computer science curriculum implementation, but sustainability themes can be reinforced through data science projects, coding applications, and digital tools that reduce PCPS's environmental footprint.
- **Legal/Ethical:** Alongside compliance with standards, legal and ethical concerns regarding data privacy, cybersecurity, and safe digital practices are increasingly prominent. By embedding internet safety and digital citizenship, PCPS addresses these concerns while reinforcing its commitment to safe learning environments, a core component of its Comprehensive Plan.

Post-COVID Realities

The COVID-19 pandemic accelerated digital transformation across education systems. According to Furstenthal, Hirt, and Roth (2021), crises act as “adrenaline for innovation,” pushing organizations to adopt practices that might otherwise have taken years to develop. For PCPS, the pandemic underscored the importance of digital capacity, from virtual instruction to online communication with families. The new curriculum builds upon these lessons, ensuring that digital learning is not an emergency response but a sustainable feature of teaching and learning.

For PCPS, the COVID-19 pandemic provided an experience of these dynamics. Remote learning accelerated the adoption of digital platforms, highlighting access inequities while demonstrating new instructional possibilities. By treating the VDOE mandate not as a burden but as a strategic opportunity, PCPS exemplified Cohen, Quinn, and Roth's (2019) call for organizations to paint a bold “north star” vision of how innovation can transform internal practice and external positioning.

External Organizational Drivers

In December 2024, the VDOE released the revised 2025 Computer Science SOLs, accompanied by assurances that professional development and supporting resources would be provided in early 2025. The mandate required cross-curricular integration beginning with the 2025–2026

academic year. While many urban school divisions in Virginia begin after Labor Day, rural districts such as PCPS start in early August to accommodate inclement weather and complete the first semester before the new year begins. This creates a natural break between the two semesters, similar to colleges and universities. However, this structural scheduling difference left PCPS with a shorter timeframe to prepare for implementing the new curriculum. As of September 1, 2025, no statewide professional development or resources had been delivered, forcing PCPS to act independently.

Division leaders immediately began creating and revising the 2018 Computer Science Standards curriculum while simultaneously seeking out external training. One pivotal step was participation in a regional training at the New College Institute (NCI), where technology specialists and administrators from four school divisions collaborated to review the standards and identify potential supports. From this partnership, PCPS integrated new applications and coding equipment into its instructional program, ensuring that students and teachers had access to emerging computer science tools despite the lack of state-level guidance.

Internal Organizational Drivers

Internally, the curriculum aligns with the district's Comprehensive Five-Year Plan, which establishes five strategic goals: academic achievement, instructional programming, positive school climates, safe learning environments, and community relations. The Strategic Rationale section will explore these further.

The decision-making processes that led to the adoption of the curriculum also reflect internal strengths. Literature emphasises the importance of structured problem-solving and decision-making in ensuring speed and quality (Conn and McLean, 2020; Fisher, Ury and Patton, 2011). Given the short implementation window, PCPS applied these principles to balance collaboration with timely action. Routine decisions were delegated to teachers and specialists, while high-stakes policy choices were retained at the School Board level, consistent with De Smet, Hewes, and Weiss's (2020) guidance on empowering employees for smarter decisions.

Strategic Opportunity

Ultimately, the rationale for the curriculum lies in transforming a mandate into a strategic opportunity. For PCPS, this vision included preparing students for the workforce of the 2030s, reducing inequities in access to technology, and embedding resilience against future disruptions. By aligning external mandates with internal goals and leveraging distributed leadership and structured decision-making, the district positioned itself to achieve compliance and transformation.

Literature Review

Literature demonstrates that disruptive innovation in education requires a synthesis of distributed leadership, structured decision-making, adaptive strategy, and human-centred culture. The literature on leadership, problem-solving, and innovation provides a critical foundation for understanding PCPS's development of the Computer Science Curriculum. Insights from Modules I and II offer essential grounding in distributed leadership, organizational culture, and structured decision-making. At the same time, literature from Module III expands this perspective to encompass innovation, crisis-driven transformation, and human-centred leadership in the digital era.

Distributed Leadership and Organizational Culture

Distributed leadership has become central in modern education and organizational theory. Bardy (2016) argues that management must be seen as a two-way, systemic relationship grounded in ethics, social relations, and institutional structures. Similarly, Goodwin and Cameron (2015) emphasise the importance of collective efficacy, suggesting that leadership effectiveness emerges when responsibility is shared across multiple stakeholders.

PCPS adopted this distributed model during the design of its computer science curriculum. Teachers, parents, students, and retired specialists were actively involved in advisory committees, ensuring those closest to the work had a voice in shaping the initiative. This reflects Columbia Business School's (2020) framing of leadership as "collective intelligence," where organizations leverage diverse perspectives to strengthen decision-making.

Organizational culture plays a vital role in enabling distributed leadership to thrive. Fuchs and Shehadeh (2017) argue that high-performance cultures require transformational change and organizational health. Marzano et al. (2018) identify continuous improvement and interdependent systems as essential features of high-reliability schools. By embedding innovation within its five-year Comprehensive Plan, PCPS created a structured yet flexible culture capable of adapting to new mandates while maintaining stability.

Problem-Solving and Decision-Making

PCPS focused on the importance of problem-solving and decision-making in uncertain contexts. Fisher, Ury, and Patton (2011) argue that principled negotiation requires separating people from problems, focusing on interests rather than positions, and generating options for mutual gain. Conn and McLean (2020) build on this by identifying six problem-solving mindsets— "that encourages curiosity, embraces imperfection, rewards a dragonfly-eye view of the problem, creates new data from experiments and collective intelligence, and drives action through compelling show-and-tell storytelling."

PCPS applied these insights by creating a structured framework for decision-making during the rapid implementation of the curriculum. As De Smet, Hewes, and Weiss (2020) emphasize, empowering employees to make informed decisions increases speed and quality. Routine decisions—such as specific instructional strategies—were delegated to teacher leaders, while strategic choices remained with senior leadership and the School Board. This balance ensured that collaboration did not slow progress, reflecting Plaut’s (2008) observation that effective problem-solving systems require both formal processes and informal flexibility.

Human-Centred and Technology-Enabled Leadership

As Ulrich et al. (2025) argue, the future of people management is “more personal, more tech, more human.” Technology can free leaders from administrative burdens, allowing more time for coaching, empathy, and personalized professional development. This vision aligns with Cable’s (2018) observation that employee motivation depends on activating “seeking systems” through experimentation, purpose, and self-expression.

PCPS operationalized these principles by embedding professional learning communities, mentoring structures, and safe spaces for teachers to experiment with digital tools. The district ensured that change was sustainable and culturally embedded by combining technology-enabled efficiency with human-centered leadership. This approach also resonates with Jesuthasan (2019), who argues that organizations must align diverse work experiences to a shared purpose and mission.

Opportunity Selection and Innovation Metrics

Innovation requires bold vision and careful selection and evaluation of opportunities. Andrew (2017) provides an “opportunity filter” based on ability, reward, enhancement, appreciation, and referral, which PCPS applied to prioritize initiatives such as cybersecurity education and coding pathways. These initiatives were chosen for their academic impact, alignment with workforce needs, and community relevance.

Kirsner (2021) warns against premature reliance on rigid financial metrics, which can stifle innovation. Instead, organizations should adopt a staged “metrics on-ramp,” moving from early progress indicators to long-term impact measures. PCPS applied this principle by beginning with teacher engagement and student participation as early indicators, later transitioning to outcomes such as postsecondary readiness and equity of access. This staged approach reflects Marzano et al.’s (2018) emphasis on continuous improvement cycles.

Strategic Rationale

The strategic rationale for PCPS's development of a Computer Science Curriculum rests on its ability to simultaneously meet an external state mandate and advance the district's internal long-term goals. Rather than treating the VDOE's 2024 SOL as a narrow compliance requirement, PCPS identified the opportunity to use the mandate as a lever for transformation. This approach reflects Reeves's (2024) contention that an effective strategy must be situational and adaptive, designed to meet immediate pressures while securing long-term competitiveness.

Alignment with the Comprehensive Plan

PCPS anchored its rationale in the district's Comprehensive Five-Year Plan, ensuring that the new curriculum advanced each of the plan's five goals.

1. **Academic Achievement** was prioritized through integrating computer science into core learning, equipping students with digital literacy skills essential for academic success and workforce readiness. As Marzano et al. (2018) argue, effective teaching and learning depend on systemic alignment with evidence-based practices, and computer science offers a powerful means to reinforce this alignment.
2. **Instructional Programming** was enhanced by embedding technology-rich resources into teaching and learning. This enabled personalized instruction, including remediation for struggling learners and enrichment for advanced students, reflecting Goodwin and Cameron's (2015) emphasis on the role of collaboration and innovation in powerful learning environments.
3. **Positive School Climates** were supported by providing teachers with digital tools to reduce administrative burdens and enhance their student engagement capacity. This aligns with Cable's (2018) observation that motivation is sustained when educators are able to experiment, express their strengths, and personalize their contributions.
4. **Safe Learning Environments** were strengthened by embedding digital citizenship and internet safety within the curriculum. In an era where online risks are significant, this priority reflected both community concerns and Bardy's (2016) framing of leadership as an ethical responsibility that integrates institutional values with social needs.
5. **Community Relations** were reinforced through improved communication and celebration of student success in technology-related fields. This emphasis on engagement reflects another of Epstein et al.'s (2019) findings that partnerships with families and communities enhance both legitimacy and sustainability in educational innovation.

By addressing all five goals, PCPS demonstrated that the new curriculum was not an isolated initiative but a strategic extension of its broader mission.

Responding to External Pressures

Externally, PCPS recognized that economic, technological, and social pressures demanded urgent action. Galvin and LaBerge (2021) emphasize that digital capabilities are a key determinant of competitiveness in the post-pandemic era, and rural divisions like PCPS cannot afford to allow students to fall behind. Moreover, Furstenthal, Hirt, and Roth (2021) note that crises accelerate innovation, creating opportunities for bold actors to emerge stronger than peers. By not focusing on the mandate and shortened timeframe as a crisis and instead seizing the VDOE mandate as an opportunity, PCPS acted with the courage and clarity that HBR IdeaCast Episode 572 identifies as essential to transformation.

The district also acknowledged that failing to innovate would carry significant risks. Without a robust computer science curriculum, students could face long-term disadvantages in higher education and employment, while the district itself risked reputational harm and potential state intervention. This reflects Cohen, Quinn, and Roth's (2019) argument that innovation must be kept "front and center" in strategic planning, rather than treated as peripheral.

Leveraging Organizational Strengths

The strategic rationale was further grounded in PCPS's organizational capacity for distributed leadership and structured decision-making. By drawing on the distributed model described by Columbia Business School (2020), PCPS ensured that diverse voices shaped the design process. This approach enhanced the curriculum's quality and secured broad buy-in, which is critical in rural contexts where trust and collaboration are essential.

At the same time, the district recognized the need for rapid implementation. Conn and McLean (2020) caution that in uncertain environments, over-collaboration can lead to paralysis. By applying the problem-solving and decision-making frameworks, PCPS delegated operational decisions to those most knowledgeable and with training and expertise while retaining strategic oversight at the leadership level. This balance ensured the curriculum was delivered quickly, consistent with De Smet, Hewes, and Weiss's (2020) call to empower employees for smarter, faster decisions.

A Forward-Looking Vision

Ultimately, the rationale for the new curriculum extended beyond compliance and immediate needs. PCPS articulated a forward-looking vision of preparing students for the workforce of the

2030s, where artificial intelligence, automation, and data science will dominate. This reflects Jesuthasan's (2019) assertion that organizations must align diverse work arrangements to a shared mission and purpose, and Andrew's (2017) guidance that leaders must carefully select opportunities that maximize unique capabilities.

By integrating computer science into its strategic fabric, PCPS complied with state requirements and positioned itself as a forward-thinking district capable of leveraging innovation to achieve equity, resilience, and sustainability. The strategic rationale was therefore not simply to meet an external demand but to reimagine what was possible for a rural school division in a digital world.

Implementation Strategy

Implementing the 2024 Virginia Computer Science Standards of Learning (SOLs) within Patrick County Public Schools (PCPS) represents a compliance requirement and a transformative opportunity to reshape teaching and learning across the division. Unlike previous curricular updates treated as add-ons, this initiative is designed as a structural feature of PCPS, woven into every aspect of the district's instructional and cultural fabric. It draws on distributive leadership principles (Li, 2016; Bardy, 2016), ensuring that those closest to the curriculum—teachers, students, parents, and retired specialists—are engaged as active co-creators. Equally important, the plan applies structured decision-making approaches (Conn & McLean, 2020), enabling PCPS to respond quickly to a compressed state timeline while maintaining collaboration and buy-in.

The newly developed PCPS Computer Science Curriculum incorporates an intentional AI focus woven across grade levels, emphasizing the ethical use of artificial intelligence. Development involved multiple voices, including classroom teachers, Computer Instructional Assistants, Principals, Instructional Coaches, and retired Technology Instructional Coordinators who had been instrumental in the 2018 Computer Science framework. To ensure equitable access, the division reassigned 175 surplus iPads to computer labs and preloaded them with resources. Although PCPS is a 1:1 device division, the lab-based devices provided stability for programs requiring dedicated installations.

The curriculum achieves seamless vertical alignment from kindergarten through twelfth grade. Students in grades K–7 begin with *Swift*, then transition to *X-Code* at the high school level through a Career and Technical Education (CTE) course. This ensures that graduates possess a complete progression of coding skills and career-ready credentials. Resources were deliberately organized to be user-friendly, with pacing guides and materials stored in Google Folders and hyperlinked to tools such as *CODE.org* and *Common Sense Media* for quick access.

Implementation is conceived as a multi-phase process. The first phase emphasizes professional development and teacher empowerment. Teachers are the anchors for curriculum reform, and professional learning opportunities—summer institutes, PLCs, peer coaching, and

experimentation with interdisciplinary projects—were prioritized to build expertise and ensure teacher buy-in. The second phase focuses on full curriculum and resource integration, ensuring vertical alignment while addressing the rural digital divide through infrastructure upgrades and partnerships with colleges and technology-focused businesses (Jesuthasan, 2019). The third phase centers on evaluation and refinement. Following Kirsner (2021), PCPS will emphasize adaptive evaluation, beginning with teacher engagement and student participation, then expanding to mastery of SOL benchmarks, portfolio quality, and postsecondary outcomes.

Underlying these phases is the structured problem-solving framework outlined in Module II, which requires defining problems, generating alternatives, weighing trade-offs, and integrating feedback (Conn & McLean, 2020). For example, technology procurement decisions were made collaboratively, balancing classroom needs, IT expertise, and fiscal responsibility. This aligns with De Smet, Hewes, and Weiss's (2020) argument that empowering employees closest to issues strengthens organizational health.

Change management strategies were embedded to anticipate stakeholder concerns. Teachers' anxieties about workload were addressed through co-creating the curriculum and increasing buy-in. Parents' concerns about screen time and equity were mitigated through workshops on digital citizenship and targeted device distribution. School Board concerns about cost and sustainability were answered by embedding the initiative into the operating budget while leveraging external partnerships. This reflects Sull, Turconi, and Yoder's (2018) balance of clarity and flexibility.

Finally, the strategy is explicitly aligned with the Comprehensive 5-Year Plan. Each goal is advanced: Academic Achievement is strengthened by embedding computational thinking into core subjects; Instructional Programming is enriched through expanded pathways; Positive Climate is promoted through teacher empowerment and student engagement; Safe Environments are reinforced by cybersecurity and digital citizenship standards; and Community Relations are deepened through partnerships and communication. Sustainability is built into this approach, reflecting Ulrich et al.'s (2025) emphasis on future-focused, human-centered systems. By investing in people, infrastructure, and adaptive evaluation, PCPS has positioned itself as a resilient, innovative rural district capable of turning compliance into lasting transformation.

Challenges and Risk Management

While the proposal to adopt the 2024 Virginia Computer Science Standards offers tremendous opportunities for PCPS, it also presents significant implementation challenges. Recognizing and addressing these risks is essential to ensure the initiative succeeds in the short and long term. As with any disruptive reform, the issues involve technical adjustments and cultural shifts, requiring proactive planning and adaptive responses.

One of the most immediate challenges relates to professional capacity. Teachers are central to the success of the curriculum, yet introducing new standards requires considerable training and confidence-building. In rural contexts such as PCPS, where staff often wear multiple hats and resources are stretched, educators with additional responsibilities may be overwhelmed. Teachers may experience increased stress or even resistance without careful attention to professional development. Distributive leadership provides a pathway to mitigate this risk. By involving teachers as co-creators of the curriculum, rather than passive implementers, the district can foster ownership and intrinsic motivation, consistent with Cable's (2018) argument that engagement improves when individuals can play to their strengths and personalize their work. Ensuring that professional learning is collaborative, supported by peer coaching, and framed as an opportunity for growth rather than compliance will reduce this challenge.

Another challenge is technological capacity and equity. The implementation of computer science standards requires not only an appropriate curriculum but also adequate infrastructure. In rural areas, gaps in broadband access and device availability remain persistent barriers. If unaddressed, these inequities could exacerbate existing divides, leaving some students unable to fully participate. The district must therefore prioritize investment in reliable broadband, modern devices, and robust technical support systems. Partnerships with state agencies, technology companies, and local businesses can provide additional support. As Jesuthasan (2019) has noted, successful organizations thrive when they align diverse resources around shared purpose; in this case, partnerships are critical for ensuring equitable access and sustaining the program over time.

Time constraints also pose a risk. The Virginia Department of Education has set a relatively short implementation window (2024), leaving limited opportunity for gradual adoption (Virginia Department of Education, 2024). Without a structured approach, there is a danger that rushed implementation could lead to uneven quality, with some schools or classrooms progressing more effectively than others. PCPS can mitigate this risk by using the structured problem-solving frameworks explored in Module 2. By clearly defining each step, delegating decisions to those closest to the issues, and maintaining iterative cycles of reflection and refinement, the district can respond quickly while still preserving quality (Conn and McLean, 2020).

Financial sustainability represents another critical concern. School boards and communities will rightly ask whether the program is affordable and whether it diverts resources from other priorities. Sull, Turconi, and Yoder (2018) remind us that successful strategy execution requires balancing clarity and flexibility: the district must present a clear financial plan while retaining the flexibility to adapt to changing conditions. Embedding the program into recurring budgets while pursuing external grants and partnerships ensures that it is not dependent on one-time funding streams. Transparency with stakeholders about costs and benefits will also help to build trust and maintain long-term support.

Cultural resistance is a further challenge that cannot be overlooked. New initiatives often generate scepticism, particularly when they involve changes to long-established practices. Teachers may fear increased accountability pressures, parents may worry about excessive screen time, and some community members may question the relevance of computer science in a rural context. Anticipating and addressing these concerns through communication, transparency, and engagement is essential. Epstein et al. (2019) emphasise that school success depends on strong family and community partnerships; by creating forums for dialogue and involving parents in digital citizenship workshops, PCPS can transform potential resistance into collaboration. Similarly, by highlighting how computer science connects to local workforce development, the district can demonstrate that the program benefits students and the wider community.

Finally, the inherent uncertainties of innovation pose their own risks. Kirsner (2021) warns that organizations often stifle innovation by relying too quickly on rigid financial or performance metrics. For PCPS, there is a danger that early evaluations could focus too narrowly on test scores or short-term outcomes, undermining the broader goals of the curriculum. The district must adopt an adaptive evaluation framework that evolves to address this. Early indicators should emphasize engagement and capacity-building, while longer-term metrics can assess mastery, project quality, and graduate outcomes. By pacing evaluation carefully, PCPS ensures accountability without sacrificing innovation.

Anticipated Outcomes and Impact

Adopting and implementing the 2024 Virginia Computer Science Standards of Learning (SOLs) in Patrick County Public Schools (PCPS) will yield transformative outcomes for students, educators, and the wider community. These anticipated impacts extend beyond compliance with state mandates and reflect the district's broader strategic vision, as articulated in the Comprehensive 5-Year Plan. By embedding computer science across the K–12 continuum, PCPS enhances academic achievement and fosters workforce readiness, digital citizenship, and stronger community connections. The anticipated outcomes can be understood across three interrelated dimensions: student learning and achievement, organizational culture and professional growth, community engagement and economic development.

One of the most direct outcomes relates to student learning. The new standards provide structured opportunities for computational thinking, coding, and problem-solving at every grade level, ensuring students develop progressively complex skills. Collectively, these standards position students as consumers of technology and creators and evaluators capable of engaging in authentic, complex problem-solving. This directly advances Goal 1 of the Comprehensive Plan on Academic Achievement by embedding high-level skills across the curriculum.

Another anticipated impact is the enrichment of instructional programming. Technology can be a powerful tool for both remediation and extension. For struggling learners, adaptive technology platforms can provide personalized feedback and support, helping to close gaps in core subjects such as mathematics and literacy. Opportunities such as dual-enrollment courses, advanced placement pathways, and student-designed projects extend learning beyond traditional boundaries. By building in these differentiated opportunities, PCPS aligns the curriculum with Goal 2 of the Comprehensive Plan, emphasizing the importance of instructional programming supporting diverse learners. In this way, the initiative reinforces equity by ensuring that all students can access meaningful and challenging learning experiences regardless of ability.

Positive impacts are also expected on school climate and culture. One of the persistent challenges in education, particularly in rural districts, is teacher stress and burnout. By providing robust professional development and ensuring teachers are treated as co-creators of the reform, PCPS helps to build a culture of collaboration and professional growth. This distributive approach reflects Li's (2016) argument that leadership is strengthened when shared and Bardy's (2016) emphasis on the ethical and social dimensions of human-centred management. As teachers build confidence in their ability to deliver the new standards, they are more likely to experience professional fulfillment, contributing to positive school climates. Moreover, student engagement is expected to rise as learners take ownership of authentic projects, echoing Cable's (2018) findings that motivation and purpose are activated when individuals can explore and experiment. These dynamics directly advance Goal 3 of the Comprehensive Plan by creating environments where students and staff feel supported and engaged.

A further anticipated outcome relates to safety and security. Digital citizenship and cybersecurity are embedded throughout the standards, ensuring students develop technical competence and ethical awareness. In a time when young people are increasingly exposed to the dangers of misinformation, cyberbullying, and identity theft, these lessons are essential. PCPS addresses Goal 4 of the Comprehensive Plan on safe learning environments by proactively equipping students with the tools to navigate digital environments responsibly. The benefits extend beyond the classroom, as students carry these skills into their personal lives and communities.

Community engagement and economic development are also expected outcomes of the reform. By aligning the computer science curriculum with local workforce needs, PCPS creates stronger pathways from school to employment. Partnerships with local businesses, community colleges, and universities will provide students with internships, mentorships, and dual-enrollment coursework opportunities. These initiatives strengthen ties between the schools and the community, directly supporting Goal 5 of the Comprehensive Plan. Moreover, by showcasing student projects at community events, PCPS highlights its role as a driver of innovation and progress in the region. This reinforces the message that rural schools can be leaders in preparing students for a technology-driven world, thereby boosting community pride and investment.

Beyond these specific outcomes, adopting the standards is expected to reshape the organizational culture of PCPS in line with contemporary trends in education and management. Ulrich et al. (2025) emphasize that future organizations will need people management systems that are more personalized, fluid, and data-driven. PCPS reflects this trend by using technology not simply for automation but as a way to empower staff and students. Teachers will be freed from repetitive tasks, allowing them to focus on coaching, empathy, and inspiration, while students can pursue personalized learning pathways. This alignment with cutting-edge thinking ensures that PCPS is responding to current demands and positioning itself for the future.

Importantly, the anticipated impacts are not limited to technical skills or immediate outcomes. They also include deeper cultural and ethical dimensions. As Kirsner (2021) notes, innovation requires a reliable transition phase where early metrics are allowed to evolve into more robust measures of success. For PCPS, this means recognizing that the true impact of the reform may not be visible in the first year or two but will emerge over time as students demonstrate new competencies, teachers adapt to new ways of working, and communities experience the benefits of stronger educational pathways. Adopting a long-term perspective ensures that the district does not prematurely judge or undermine the initiative but instead nurtures it into maturity.

Sustainability and Long-Term Vision

The next steps for PCPS focus on sustaining implementation through ongoing professional development and strategic resource acquisition. A structured training plan has been established in which teachers and instructional assistants meet with Division Instructional Coaches and a retired Technology Education Specialist bi-monthly to ensure consistent guidance and support. Professional learning began with a division-wide back-to-school training in August, establishing common expectations and shared practices for the new curriculum. To further strengthen implementation, PCPS developed a resource priority list and has committed to purchasing up-to-date coding equipment so students can apply their learning with authentic, hands-on learning experiences. These steps position the division to refine and expand its computer science program while maintaining fidelity to state standards and local instructional goals.

Sustainability is central to PCPS's curriculum vision. Rural schools face particular challenges in maintaining reforms over time, including limited budgets, fluctuating enrolments, and persistent technological inequities. Addressing these challenges requires a systemic approach that ensures continuity, builds resilience, and embeds innovation into the district's fabric. PCPS's long-term vision is to create a sustainable, adaptable, and forward-looking educational environment that prepares students for the digital age's demands while reinforcing the community's values.

Financial sustainability is one of the most pressing considerations. Educational reforms often falter when dependent on short-term funding streams or one-time grants. For this reason, PCPS is

embedding the new computer science curriculum into the recurring operating budget rather than treating it as an add-on initiative. At the same time, PCPS will actively pursue external funding through state innovation grants, federal technology initiatives, and partnerships with local businesses. These efforts reflect the recommendation of McKinsey & Company (2019) that organizations must keep innovation front and centre in their planning processes, using it as a driver of growth rather than a discretionary expenditure. By diversifying funding sources, PCPS reduces financial risk and builds a more stable foundation for long-term success.

Human capital is another critical dimension of sustainability. Teacher retention is a persistent challenge in rural districts, where professional opportunities can be limited. Ulrich et al. (2025) argue that future organizations must embrace more personalised, fluid, and data-driven approaches to people management. PCPS reflects this by designing technically rigorous and human-centered professional development, providing teachers with coaching, mentorship, and opportunities to personalise their growth. As Cable (2018) has shown, this approach increases intrinsic motivation by allowing teachers to align their work with their strengths and sense of purpose. Moreover, by embedding distributive leadership practices, PCPS ensures that professional expertise is shared across the district, reducing reliance on individual leaders and creating a more resilient culture. Over time, this strengthens the district's ability to sustain reforms despite staff turnover.

Technological sustainability is equally important. Implementing the computer science curriculum requires substantial investment in infrastructure. Yet technology evolves rapidly, and investments that are sufficient today may be outdated tomorrow. To address this, PCPS will adopt a cycle of regular infrastructure audits and phased upgrades, ensuring that resources remain current without overwhelming the budget. This approach echoes Jesuthasan's (2019) insight that successful organizations must align diverse resources and work options around shared purpose. Partnerships with local technology companies and community colleges will further extend the district's capacity, ensuring that students and teachers can access cutting-edge tools and expertise without bearing the full financial burden.

Cultural sustainability may be the most critical element. Educational reforms succeed not only when they are well designed but when they become embedded in the identity and practices of a district. For PCPS, this means making computer science not an isolated subject but a lens through which students and teachers approach problem-solving, creativity, and collaboration. Reeves (2024) has argued that strategy must be adaptive and situational, and PCPS embraces this by positioning computer science as a dynamic framework that evolves alongside broader educational and social changes. The district ensures the initiative remains relevant and responsive by building a culture of experimentation, curiosity, and continuous improvement.

Sustainability also requires careful attention to evaluation. As Kirsner (2021) warns, premature reliance on rigid financial or performance metrics can stifle innovation. PCPS is therefore

committed to a phased evaluation framework that evolves as the initiative matures. In the short term, evaluation will focus on teacher participation in professional development, student engagement in projects, and initial mastery of foundational standards. Over time, metrics will expand to include student portfolios, college and career readiness indicators, and workforce partnerships. By pacing evaluation this way, PCPS ensures accountability while preserving the flexibility needed to sustain innovation.

Ultimately, the long-term vision is to position PCPS as a leader in rural innovation, demonstrating that small districts with limited resources can deliver world-class education. For PCPS, that vision is clear: to prepare every student to thrive in a digital, interconnected world, while preserving the values of community, equity, and resilience that define the district. By embedding innovation into its operations, PCPS ensures that this vision will endure through the current reform cycle and for future generations.

Conclusion

Adopting the 2024 Virginia Computer Science SOLs by PCPS represents more than a curricular adjustment; it is a transformative strategy redefining the district's approach to teaching, learning, and leadership. By scaffolding lessons learned in Modules I and II, and embedding them into the disruptive innovation project of Module III, PCPS demonstrates that rural districts can move beyond reactive compliance to state mandates and instead use them as catalysts for systemic growth. The result is a model of educational change that is sustainable, equitable, and deeply aligned with the district's mission to prepare students for a rapidly evolving future.

Module I emphasised the importance of distributed leadership, a principle central to PCPS's success in designing and implementing the new curriculum. By ensuring that those closest to instruction—teachers, technology specialists, students, and parents—had a meaningful voice in the process, the district not only strengthened the quality of the curriculum but also built ownership and trust. This distributive approach aligns with Bardy's (2016) argument that leadership must be rooted in ethics and relationships, and with Li's (2016) assertion that innovation thrives when leadership is connected and collaborative. Embedding distributed leadership into the design and rollout of the computer science curriculum ensured that the reform was not imposed from above but co-created, making it more effective and sustainable.

Module II provided equally important lessons in problem-solving and decision-making. The short implementation window mandated by the Virginia Department of Education (2024) created the potential for rushed or uneven adoption. Such urgency resulted in fragmented implementation and heightened resistance without a structured approach. Instead, PCPS applied the structured frameworks of Module 2, which emphasise clearly defining problems, delegating low-level decisions to those closest to them, and reserving high-stakes decisions for collaborative forums

(Conn and McLean, 2020). This approach enabled the district to act quickly while maintaining quality and inclusivity. By blending autonomy with collaboration, PCPS avoided the pitfalls of over-centralisation and over-collaboration, achieving the balance that De Smet, Hewes, and Weiss (2020) describe as essential for healthy, resilient organizations.

The new computer science curriculum aligns directly with the Comprehensive 5-Year Plan, ensuring that reform is not an isolated initiative but part of a coherent strategy. Each of the five goals of the plan is advanced through this initiative. Academic Achievement is strengthened by embedding computational thinking and problem-solving skills across the curriculum. Instructional Programming is enhanced by providing technology-based tools for both remediation and enrichment. Positive School Climate is fostered by reducing teacher stress through collaborative professional development and increasing student engagement through authentic, technology-driven projects. Safe Learning Environments are supported by explicit digital citizenship and cybersecurity instruction, preparing students to navigate online spaces responsibly. Finally, Community Relations are deepened by partnerships with local businesses, colleges, and families, showcasing the district's leadership and innovation. By aligning with all five goals, the initiative reinforces PCPS's identity as a strategic and responsive district.

Embedding this reform into the district's financial planning, professional development, technological infrastructure, and community partnerships ensures its long-term sustainability. For PCPS, that vision is to ensure that every student graduates with strong academic skills and the technological fluency, critical thinking, and ethical awareness necessary for success in the 21st century. By focusing on this vision, the district ensures that the initiative is not a short-term adjustment but a lasting transformation.

The anticipated impacts of this reform are wide-ranging. Students will develop advanced computational skills, preparing them for college, careers, and civic life. Teachers will experience renewed professional growth and collaboration, strengthening retention and morale. Communities will benefit from stronger workforce pathways and greater engagement with schools. These impacts are amplified by PCPS being a rural district, where educational innovation is often assumed to be more difficult due to limited resources. By demonstrating that rural schools can lead in implementing disruptive, forward-looking reforms, PCPS challenges stereotypes and provides a model for other districts facing similar challenges.

At the same time, PCPS recognises the risks inherent in innovation and has developed proactive strategies for managing them. Challenges related to professional capacity, technological equity, financial sustainability, cultural resistance, and premature evaluation have been identified and addressed. By embedding distributive leadership, structured decision-making, adaptive evaluation, and strong communication strategies into the implementation plan, PCPS demonstrates the resilience and adaptability that Reeves (2024) identifies as essential for strategy in complex, uncertain environments.

Adopting the 2024 Computer Science Standards represents a convergence of state mandate, local vision, and scholarly insight. It draws on ethical and collaborative leadership, structured problem-solving and decision-making, and disruptive innovation. It aligns with cutting-edge research on people management, innovation, and organizational sustainability (Ulrich et al., 2025; Bar Am et al., 2020; Kirsner, 2021), while also grounding itself in the local realities of Patrick County. This blend of theory and practice, global trends and local needs, creates a powerful reform model.

In conclusion, PCPS's work demonstrates that it is possible to meet ambitious mandates that strengthen rather than strain the organization even in resource-constrained contexts. By embedding distributed leadership, structured problem-solving, and long-term sustainability into the design and implementation of the computer science curriculum, the district has turned a compliance challenge into an opportunity for transformation. The initiative advances academic, cultural, and community goals, ensuring that PCPS not only meets the requirements of the present but also prepares its students and community for the challenges and opportunities of the future. This conclusion affirms that the accurate measure of the initiative is not in the immediate adoption of new standards. Still, it brings a lasting transformation to the district's culture, identity, and capacity for innovation.

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Appendix I

Module 1 Summary

I. Introduction

Module I, *Leadership and Strategy in Context*, established a foundation for examining how leadership theory and strategic frameworks can be applied to organizational practice. The module emphasized the shift from hierarchical, individual-driven leadership models to distributed and human-centred approaches (Bardy, 2016; Li, 2019). It also explored how strategy must be understood not as a fixed plan but as a continuous and adaptive process responsive to complex environments (Lynch, 2018; Reeves, 2024).

Within this context, Patrick County Public Schools (PCPS) provided a practical case study of how these ideas can be operationalised. PCPS, a rural school division, faces challenges related to limited resources, demographic shifts, and technological inequities. Yet, the division has achieved meaningful progress by intentionally embedding distributed leadership, human-centred management, and adaptive strategy into its operations.

Across the four assignments (L01–L04), PCPS reflected on leadership identity, critically analysed the division’s external and internal environment, demonstrated leadership in a significant safety initiative, and ultimately developed a five-year Comprehensive Plan. Taken together, these experiences highlight how Module I concepts not only informed his professional practice but also contributed to PCPS’s success. The Comprehensive Plan (L04) demonstrates how distributed leadership has been formalised into a structured framework for long-term improvement (Sull et al., 2018; Marzano et al., 2018).

II. Leadership Identity and Human-Centred Management (L01)

The superintendent for PCPS leadership identity is best described as democratic and participative, a conclusion supported by the MindTools Leadership Styles Questionnaire, in which the superintendent scored 25 out of 30 on the democratic scale. This style reflects an orientation toward consensus-building, distributed responsibility, and collaborative problem-solving rather than directive authority. In his practice as superintendent of Patrick PCPS, this leadership identity has translated into fostering environments where staff feel valued and empowered to contribute to collective goals.

The theoretical perspectives explored in Module I reinforce this orientation. Bardy (2016) emphasises that human-centred management integrates ethics, social relations, economic effects, and institutional conceptions, positioning leadership as a systemic relationship rather than a unilateral exercise of authority. This principle is evident in PCPS initiatives such as adopting new mathematics textbooks, where teachers led the selection process, and in the Career and

Technical Education grant project, which secured an Anatomage table through cross-departmental collaboration and the shared use of a county grant writer.

Li (2019) argues that leadership is fundamentally about enabling change rather than controlling processes, a principle that resonates with the superintendent's orchestration of resources and people within a rural division. By creating structures that allow distributed teams to innovate, the superintendent has enabled the division to respond adaptively to constraints. Wilkins (2016) also stresses the importance of authenticity, credibility, and self-awareness in leadership, qualities reflected in PCPS's reliance on staff surveys, open forums, and job-embedded professional development to build trust and transparency.

The emphasis on distributed leadership and human-centred management in L01 illustrates how a democratic leadership style is personally authentic and strategically effective. By aligning the superintendent's leadership identity with systemic needs, PCPS's capacity for shared decision-making and strategic responsiveness has been strengthened, establishing a foundation for the organizational analysis conducted in L02.

III. Strategic Contributions and Organizational Environment (L02)

Beyond clarifying leadership identity, the superintendent contributed directly to shaping the strategic direction of PCPS. The superintendent's approach reflects the adaptive and emergent models of strategy emphasised in Module I, particularly Lynch's (2018) argument that effective strategy must remain flexible and responsive to shifting environments. Assignment L02 highlighted these connections through analysis of PCPS's strategic contributions, a PESTLE review of its operating environment, and an evaluation of organisational culture using the McKinsey framework.

Distributive leadership has been central to advancing the PCPS Comprehensive Plan, Literacy Plan, and Assessment Plan. Each initiative demonstrates how distributed leadership and collaborative structures can convert strategic vision into actionable outcomes. Rather than prescribing direction, PCPS leaders facilitate stakeholder input, align initiatives with state expectations, and embed adaptability into planning processes.

The PESTLE analysis undertaken in L02 revealed the breadth of external pressures facing PCPS. Politically, the division operates within the constraints of state funding formulas and evolving debates on school choice. Economically, PCPS depends on an Average Daily Membership (ADM)-driven funding model that strains a rural tax base while complicating recruitment and retention. Social factors include low adult education levels and an aging population with limited ties to local schools, requiring intentional community engagement. Technologically, the division has invested in one-to-one devices and hotspots, but continues to confront inequitable broadband access. Legal requirements, such as Title IX compliance and pandemic regulations, shape

organisational practice, while environmental factors, such as rural geography, drive transportation challenges and highlight opportunities for sustainability projects like solar initiatives.

L02 also examined how PCPS leverages its internal resources and capabilities to pursue strategic objectives. Investments in instructional coaches, reading specialists, and special education coaching roles reflect intentional capacity building. These strategies illustrate how distributed leadership can extend expertise across the organisation, ensuring systemic improvement rather than isolation.

The McKinsey framework provided a lens for assessing culture, identifying PCPS between developing and high-performance. Under Wood's leadership, transparency, collaborative budgeting, and a coaching-oriented professional learning structure have strengthened organisational culture. These actions align with McKinsey's emphasis on organisational health as a driver of long-term performance (McKinsey & Company, 2017).

Ultimately, L02 demonstrated how PCPS's resilience is derived not from resource abundance but from the intentional integration of distributed leadership with adaptive strategy. By embedding these principles into planning, the division has enhanced its ability to navigate rural challenges and sustain improvement, setting the stage for the project-based innovation explored in L03.

IV. Project Leadership and Innovation (L03)

Assignment L03 required applying leadership theory to a significant project from initiation to completion. PCPS's four-year safety and security initiative is a critical case study. This project illustrates how authority, innovation, and professional integrity can converge in practice to address urgent organizational needs within the constraints of a rural school division.

As superintendent, Wood exercised authority not as a mechanism of control but as a facilitative force to convene and empower diverse stakeholders. By coordinating the efforts of law enforcement agencies, school administrators, technology staff, and community representatives, he ensured that decision-making was collaborative and transparent. This approach reflects the Columbia Business School's (2020) argument that in a Hyper-VUCA world, authority should enable collective intelligence rather than reinforce traditional hierarchies.

Innovation was central to the safety initiative. In line with Shrader's (2015) emphasis on adaptability and co-creation, the project disrupted siloed operations by integrating input from multiple departments and external partners. The outcomes included the installation of advanced security cameras, electronic access systems, panic buttons, and environmental sensors. For a rural division, these measures represented a significant step forward in proactively addressing safety, underscoring the importance of innovation as a strategic necessity rather than a luxury.

Equally significant was the role of professional integrity in guiding the project. Drawing on Besser-Jones's (2014) framework, Wood demonstrated transparency, inclusiveness, and moral clarity throughout the initiative. His leadership prioritised the well-being of students and staff, even when difficult decisions or resource constraints arose. This integrity fostered greater trust among parents, staff, and community members, ensuring the project was ethically sound and practical.

The initiative's measurable results underscore the value of this leadership approach. Data revealed a decline in unsafe behaviours, while surveys reflected stronger perceptions of safety and trust across the division. More broadly, the initiative established a culture of safety that extended beyond compliance to become a shared organizational value.

Through L03, PCPS demonstrated that distributed authority, innovation, and ethical leadership can transform high-stakes projects into lasting organisational improvements. The initiative not only advanced PCPS's safety infrastructure but also modelled how the principles of Module 1 can be applied to achieve sustainable change in a rural context.

V. Comprehensive Strategic Planning (L04)

Assignment L04 culminated Module I, requiring the design of a three—to five-year strategic plan. PCPS developed the 2025–2030 Comprehensive Plan, integrating the leadership identity established in L01, the environmental and cultural analysis of L02, and the project leadership experience of L03. The resulting framework embodied the shift from static, linear planning to the continuous, adaptive approach emphasised throughout the module.

The plan was structured around five strategic goals:

1. **Academic Achievement** – advancing student learning outcomes through rigorous instruction, targeted interventions, and data-driven decision-making.
2. **Instructional Programming** – broadening career and technical education opportunities, enhancing technology integration, and aligning curricula with workforce demands.
3. **Climate and Culture** – fostering inclusive, collaborative, and supportive environments across schools.
4. **Safety and Security** – sustaining progress from the four-year safety initiative, embedding proactive measures to ensure safe learning environments.
5. **Communication and Community Engagement** – strengthening partnerships with families, businesses, and community organisations to build trust and shared

accountability.

This plan drew heavily on scholarship addressed in Module I. Reeves (2024) emphasises that strategy must be situational and adaptive, aligning leadership approaches with shifting contexts. Sull, Turconi, and Yoder (2018) highlight the importance of balancing clarity and flexibility to ensure that strategy translates into action, a principle reflected in the Comprehensive Plan's structured goals paired with adaptive implementation. Marzano, Warrick, Rain, and DuFour (2018) advocate for high-reliability schools built on continuous improvement cycles, which informed the plan's emphasis on data-driven progress monitoring. Goodwin and Cameron (2015) stress balanced leadership and collective efficacy, concepts embedded in the distributed leadership model adopted by PCPS. Finally, Epstein et al. (2019) underline the importance of school, family, and community partnerships, directly informing the plan's commitment to communication and engagement.

The plan also addressed global considerations that extend beyond the immediate local context. Sustainability initiatives, such as solar energy projects, reflected the division's commitment to environmental responsibility. Diversity, equity, and inclusion were woven into instructional programming and community engagement, ensuring equitable access and representation. These dimensions reinforced PCPS's role not only as an educational provider but as a community leader in resilience and social responsibility.

By embedding distributed leadership into its five goals, the Comprehensive Plan ensured that PCPS's strategy was more than a document; it was a dynamic framework for continuous improvement. The plan illustrated how Module 1's theoretical insights could be translated into a coherent, long-term vision for a rural school division, demonstrating the practical value of integrating human-centred management and adaptive strategy into systemic planning.

VI. Conclusion

Module 1, *Leadership and Strategy in Context*, enabled the Division Superintendent to connect leadership theory with practical application in PCPS. Across four assignments, democratic leadership was examined through the lens of human-centred and distributed leadership (Bardy, 2016; Li, 2019; Wilkins, 2016), conducted strategic and cultural analysis of the division using established frameworks (Lynch, 2018; McKinsey & Company, 2017), demonstrated project leadership that integrated innovation and professional integrity (Columbia Business School, 2020; Shrader, 2015; Besser-Jones, 2014), and designed a five-year Comprehensive Plan grounded in adaptive and sustainable strategy (Reeves, 2024; Sull, Turconi and Yoder, 2018; Marzano et al., 2018; Goodwin and Cameron, 2015; Epstein et al., 2019).

The unifying theme across these assignments is that PCPS's success has been achieved by embedding distributed leadership and adaptive strategy into every level of the organisation. In a rural context where funding, staffing, and technological challenges persist, these approaches have allowed the division to leverage its limited resources, foster innovation, and strengthen trust with staff and community stakeholders. The Comprehensive Plan illustrates how theory from Module I has been transformed into a living, practical framework for improvement.

Module I has reinforced that effective leadership in a hyper-VUCA world is relational, adaptive, and ethically grounded. It provided the intellectual foundation and practical tools that continue to shape PCPS. Module I has not only supported academic growth but also contributed to sustaining and advancing PCPS's mission.

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Appendix II

Module II Summary

Introduction

Module II, *Problem Solving and Decision Making in Business*, advanced PCPS's exploration of leadership by focusing on the most sophisticated methods and frameworks for addressing organisational challenges. Whereas Module I emphasised distributed leadership and strategic planning, Module II extended this foundation by interrogating how decisions are made, the processes that underpin them, and the techniques leaders employ to ensure that solutions are both innovative and sustainable.

The context of PCPS provided a critical backdrop for this learning. As a rural division, PCPS faces persistent challenges related to resource allocation, staffing shortages, community demographics, and technological inequities. These realities place heightened importance on ensuring that problem-solving and decision-making are systematic, collaborative, and informed by evidence. Across the four assignments (L01–L04), PCPS examined their current decision-making culture, evaluated the skills and tools required to support effective decision-making, reflected on a significant decision in practice, and proposed a formalised framework for collaborative problem-solving and decision-making within the division.

In keeping with the objectives of Module II, this summary highlights how the theories, frameworks, and case studies studied—including approaches to decision-making autonomy, sensemaking under uncertainty, and structured frameworks for organisational learning—were applied within PCPS. In doing so, it demonstrates how the division has leveraged advanced decision-making practices to extend professional integrity, improve resilience, and institutionalise innovation in the face of rural challenges (Conn & McLean, 2020; Hollnagel, 2007; Murguia, 2024; Sull, Turconi & Yoder, 2018).

Organisational Context and Problem-Solving Culture (L01)

In PCPS, problem-solving and decision-making occur through a combination of formal structures and informal collaboration. The division has adopted what Murguia (2024) describes as a “fluid hierarchy,” allowing leadership to shift depending on expertise, urgency, and context. This approach contrasts with rigidly hierarchical organisations by embedding flexibility into decision-making, while still maintaining accountability through established governance processes.

The analysis in L01 revealed both strengths and weaknesses in the division's problem-solving culture. Among its strengths is the reliance on distributed leadership and a coaching model that empowers staff across all levels of the organisation to take ownership of decisions. Formal tools

such as SWOT and PESTEL analyses are used to frame strategic questions, while collaborative structures, including teacher-led committees and staff surveys, ensure that decisions reflect a wide range of perspectives (Conn & McLean, 2020). Informal channels also play a role, with trust-based relationships enabling staff to surface problems quickly and address them before they escalate.

However, challenges remain. Leadership turnover can disrupt consistency, and the absence of a universally applied framework for decision-making sometimes results in variability across schools. Plaut (2008) argues that strong problem-solving systems depend on consistent structures that foster creativity and accountability. PCPS has demonstrated elements of this but has not always applied processes evenly, leading to gaps in implementation.

The division also faces difficulties in maintaining efficiency when balancing broad stakeholder input with the urgency of decision-making. HBR IdeaCast (2017) highlights that effective problem-solving depends on carefully distinguishing between identifying problems and implementing solutions. PCPS has made strides in surfacing challenges through open communication, but occasionally struggles to convert collaborative dialogue into decisive action.

Recommendations emerging from L01 included formalising a decision-making framework, expanding coaching supports, and creating stronger feedback loops to evaluate decision effectiveness. Interest-based negotiation strategies, as advanced by Fisher, Ury, and Patton (2011), were identified as particularly relevant to ensuring decisions address underlying needs rather than superficial positions. By embedding such practices, PCPS could strengthen its existing culture of distributed leadership and improve its ability to make timely, high-quality decisions that balance inclusivity with effectiveness.

Advanced Skills and Tools for Decision-Making (L02)

Assignment L02 expanded the analysis of problem-solving by examining the range of decisions in PCPS and the skills and tools required to support them. These decisions span operational issues such as resource allocation and scheduling, alongside strategic priorities including curriculum adoption, safety initiatives, and long-term budgeting. To address these varied challenges, PCPS has relied on a framework of autonomy and distributed leadership balanced with formal processes of accountability.

A critical influence on this practice has been McGinnis's (2019) categorisation of decisions into no-stakes, low-stakes, and high-stakes. This framework has enabled PCPS to match decision-making processes with the level of risk and consequence, ensuring that routine decisions are streamlined while complex issues receive appropriate scrutiny.

The skills underpinning effective decision-making in PCPS align with those highlighted in the literature. Marr (2016) emphasises the importance of using data as a starting point for strategy, a

principle reflected in PCPS's investment in data dashboards and analytics. Decision-making is supported by both structured and unstructured data, enabling leaders to triangulate quantitative results with qualitative insights from surveys and stakeholder engagement (Harvard Business Review Publishing, 2012). Equally important are interpersonal skills, such as emotional intelligence and communication, which are essential for facilitating collaboration in a distributed leadership environment (Dearborn & Swanson, 2017; Conn & McLean, 2020).

PCPS has also leveraged digital tools to enhance efficiency and transparency. Automated workflows, cloud-based collaboration platforms, and artificial intelligence have been integrated into processes such as scheduling, data analysis, and community engagement. Sisense Team (2023) argues that effective business intelligence depends on both technological infrastructure and leadership's willingness to embed data culture, a balance that PCPS has sought to maintain.

Measuring the effectiveness of problem-solving and decision-making has been an ongoing priority. HBR IdeaCast (2012) stresses that leaders must move beyond decision quality alone and assess outcomes against implementation and learning. PCPS evaluates decisions using a combination of key performance indicators, cost-benefit analyses, and qualitative feedback. Wang (2016) further highlights the role of continuous learning and reflection, principles evident in PCPS's use of staff forums, surveys, and ongoing professional development as feedback mechanisms.

Through this combination of analytical, technological, and interpersonal skills, PCPS has developed an evidence-based and collaborative approach to decision-making. While resource constraints remain a challenge, the division has demonstrated how rural schools can adopt advanced practices to support innovation and resilience.

Authority, Innovation, and Integrity in Practice (L03)

Assignment L03 provided the opportunity to examine a specific problem-solving and decision-making case focused on the staffing shortage of school counselors in 2025. This challenge required rapid, innovative, and ethically sound leadership. The case illustrated how authority, autonomy, and integrity converge in practice, especially in rural schools, where resource scarcity magnifies the consequences of decision-making.

PCPS applied a range of theoretical frameworks to guide this process. Klein (2007) emphasises the importance of sensemaking—distinguishing signal from noise—when leaders are confronted with ambiguous and rapidly evolving circumstances. This concept shaped the superintendent's ability to prioritise reliable information while disregarding distractions. Similarly, Hollnagel's (2007) perspective on dynamic decision-making highlights the necessity of making informed choices under conditions of uncertainty, a reality that characterised the compressed timeframe for filling critical staffing roles.

The risk of bias in decision-making was also considered. Beard (2021) and Garofalo (2016) both note how unconscious bias and systemic “noise” can distort decision outcomes. To mitigate these risks, PCPS implemented transparent hiring processes, gathered stakeholder feedback, and explored creative staffing alternatives. Pettersson (2007) underscores the relationship between task design and safety, a principle reflected in PCPS’s efforts to ensure that new counselor roles were manageable and effectively integrated into school operations.

Professional integrity was central to the decision-making process. Besser-Jones (2014) argues that ethical leadership requires inclusiveness and moral clarity, while Tippet (2019) reinforces the value of deliberate bias mitigation strategies. In practice, PCPS communicated decisions openly with staff and community members, prioritising student well-being even when compromises were necessary. Williams (2007) adds that risk management must be embedded into decision-making, a principle evident in the superintendent’s efforts to evaluate the immediate and long-term implications of staffing choices.

The case study highlighted strengths and limitations in PCPS’s approach. Evidence-based analysis and transparency were clear strengths, while the compressed timeline led to reduced input from principals, raising the risk of perceived inequity. PCPS recognised the importance of safeguarding distributed leadership processes even in high-pressure contexts. Lessons learned included the value of succession planning, stronger HR pipelines, and knowledge management systems to ensure organisational resilience in future staffing challenges.

Ultimately, L03 demonstrated how authority, innovation, and integrity can be applied to solve critical problems. By blending sensemaking, dynamic decision-making, and ethical leadership, leaders ensured that PCPS addressed an urgent need while reinforcing its culture of transparency and student-centred values.

Developing a Formal Collaborative Process (L04)

Assignment L04 synthesised the insights from earlier tasks to design a formal process for collaborative problem-solving and decision-making in PCPS). Building on the distributed leadership model, PCPS developed a nine-step framework intended to institutionalise decision-making practices across the division. This process sought to balance inclusivity with efficiency, ensuring PCPS could maintain responsiveness while embedding consistency in its approach.

The nine-step framework reflected key principles from the literature. Knight (2021) stresses that effective teams must move beyond problem identification toward actionable solutions, a distinction captured by requiring leaders to explicitly define challenges before generating strategies. Reeves (2024) argues that strategy must be adaptive and situational, which informed the framework’s emphasis on feedback loops and reflection to adjust decisions in real time. Sull,

Turconi and Yoder (2018) highlight the importance of balancing clarity with flexibility; in response, the framework outlined clear roles and accountability structures while leaving space for innovation.

The framework also drew upon McKinsey's emphasis on organisational health, particularly the role of culture in sustaining high performance (McKinsey & Company, 2017). By embedding collaborative structures such as professional learning communities (PLCs) and cross-functional teams, the process aimed to align culture with strategic intent. Columbia Business School (2020) similarly underscores the importance of collective intelligence in complex contexts, a principle reflected in PCPS's reliance on broad stakeholder engagement.

At the operational level, the framework formalised steps for root-cause analysis, data integration, stakeholder communication, and outcome evaluation. These steps mirrored Plaut's (2008) assertion that strong problem-solving systems must balance structure and creativity. By codifying these elements, the framework aimed to address weaknesses identified in L01, such as inconsistent application of decision-making processes and variable coaching practices.

Critically, the proposed process recognised the unique challenges of PCPS's rural context. Scarcity of resources, reliance on external funding, and geographic isolation necessitate decision-making processes that are both rigorous and adaptable. By formalising a collaborative model, PCPS could reduce the risks of fragmentation while reinforcing its culture of shared responsibility.

The nine-step framework presented in L04 thus represented more than a procedural tool; it was an attempt to institutionalise the values of distributed leadership, adaptive strategy, and professional integrity into the division's daily operations. In doing so, it extended the learning of Module 2 by demonstrating how advanced theories of decision-making can be applied to design a sustainable system tailored to the realities of a rural school division.

Conclusion

Module II, *Problem Solving and Decision Making in Business*, enabled PCPS to evaluate and strengthen the decision-making culture throughout the division critically. Through L01, leaders analysed the division's existing mix of formal and informal processes, recognising the strengths of distributed leadership and the weaknesses of inconsistent application (Murguia, 2024; Plaut, 2008). In L02, PCPS explored the advanced skills and tools required to support effective decision-making, highlighting the role of data-driven strategy, emotional intelligence, and digital platforms in enhancing outcomes (Marr, 2016; Sisense Team, 2023; Conn & McLean, 2020). L03 provided a practical case study in which PCPS leaders applied frameworks of sensemaking, dynamic decision-making, and risk management to address a pressing staffing crisis with innovation and integrity (Klein, 2007; Hollnagel, 2007; Williams, 2007). Finally, in L04, PCPS

designed a nine-step collaborative framework to institutionalise decision-making processes, ensuring that PCPS could embed consistency while retaining adaptability in a rural context (Knight, 2021; Reeves, 2024; Sull, Turconi & Yoder, 2018).

The unifying theme of Module 2 is that effective problem-solving and decision-making require structure and flexibility. PCPS has demonstrated resilience by leveraging distributed leadership, cultivating a culture of collaboration, and investing in tools that align with best practices. At the same time, the division has recognised the need for greater formalisation of processes to ensure sustainability and equity across all schools.

Module II provided advanced frameworks and reflective opportunities that directly informed the professional practice of school leaders, especially the division superintendent. The integration of theory and practice reinforced that in a Hyper-VUCA environment, decisions must be evidence-based, ethically grounded, and inclusive of diverse perspectives. By embedding these principles into the nine-step framework, PCPS is positioned not only to address its current challenges but also to adapt to future uncertainties with resilience and integrity.

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