scope
Contemporary Research Topics

art & design 29:
Hospitality & Tourism
July 2025

Opinion Piece
https://doi.org/10.34074/scop.1029002

RETHINKING BAKING EDUCATION: FROM TECHNOCRATIC TRAINING TO INDUSTRY-RESPONSIVE LEARNING

Noel Remacle

Published by Otago Polytechnic Press.

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PROFESSIONAL BIOGRAPHY AND PEDAGOGICAL ORIENTATION

My professional journey began in 1980 in Belgium under the tutelage of my father and grandfather in our family bakery. Since 2007, I have occupied various roles in New Zealand and internationally, including bakery manager, consultant, product developer, and production lead for Guylian Belgian Chocolate Cafés worldwide. These positions have shaped my understanding of industry demands, operational scalability, and cross-cultural team management.

As an educator in New Zealand and Egypt, I draw on over four decades of industry experience to inform a practice that balances tradition with innovation. My ongoing commitment to reflective teaching ensures that learners see both the craft and the complexities of contemporary baking. In this opinion piece, I offer a practitioner's perspective on current assessment practices in New Zealand bakery education and propose pedagogical directions for the future.

REASSESSING VOCATIONAL BAKING EDUCATION IN AOTEAROA NEW ZEALAND

Vocational baking education in New Zealand stands at a pedagogical crossroads. Despite rapid advancements in the culinary and hospitality sectors, educational frameworks continue to be anchored in traditional, learning-outcome-based models. These models emphasise technical accuracy and standardised performance measures, often at the expense of critical soft skills, adaptability, and real-world readiness. Learning outcomes are designed to measure knowledge against qualification standards, yet there are questions within the sector whether these outcomes align with the day-to-day realities and evolving needs of the industry.

In this piece I briefly critique the limitations of technocratic training and advocate for a recalibrated model grounded in project-based learning (PBL). Drawing on theoretical literature and my own observations as a bakery educator, I outline a pathway for integrating practical expertise with pedagogical innovation to produce future-ready baking professionals.

FROM TECHNOCRATIC TO CAPABILITY-BASED APPROACHES

Conventional competency-based education often separates the mastery of discrete skills from the broader context in which they are applied. Although this approach is dependable for measuring reproducibility and precision, it falls short when it comes to nurturing wider attributes such as creativity, resilience, and leadership. To address these limitations, Hager and Holland (2006) advocate moving away from a purely competency-centred curriculum towards one that fosters capability, prioritising learners' capacity to navigate complexity and to transfer their knowledge across diverse settings.

Nowhere is this more evident than in the bakery workplace, where supply chains shift, customer tastes continually evolve, and production deadlines loom large. Here, adaptability is indispensable. In my view, educational strategies must extend far beyond teaching students to follow recipes or to replicate techniques; instead, we ought to cultivate reflective practitioners—individuals who can think on their feet under pressure, adjust their approach on the fly, and devise creative solutions when plans unravel.

PEDAGOGICAL RATIONALE FOR PROJECT-BASED LEARNING

Project-based learning (PBL) is in alignment with a capability-oriented approach to education. As Darling-Hammond et al. (2008) contend, PBL not only heightens student motivation and fosters profound learning but also cultivates transferable skills such as critical thinking, collaboration, and metacognitive awareness. Unlike the traditional technical competency-based model, which centres on repeating predefined recipes, PBL encourages students to think critically, innovate, and adapt. This is crucial in today's baking industry, which is rapidly evolving with trends such as gluten-free baking, plant-based alternatives, and sustainable production methods.

PBL focuses on active learning—students engage with real-world challenges by researching, experimenting, collaborating, and reflecting. It supports deeper learning by encouraging students to integrate knowledge from multiple sources, engage in problem-solving, and apply their skills in meaningful ways (Darling-Hammond et al., 2008). These qualities—technical proficiency, critical thinking, and leadership—are the skills today's bakery industry requires of its workers.

Motivation and engagement also increase with PBL. Blumenfeld et al. (1991) found that students working on projects that reflect real industry challenges are more likely to persist through difficulties, take initiative, and develop a stronger sense of ownership over their learning. When learners design contemporary pastries, adapt recipes for dietary needs, or develop sustainable bakery business models, they connect more deeply with their education.

Another major benefit of PBL is its emphasis on teamwork and communication—essential skills in any bakery. Whether coordinating with a bakery team, interacting with suppliers, or serving customers, bakers need to collaborate effectively. Research by Hmelo-Silver (2004) suggests that learning in a collaborative PBL setting improves knowledge retention and the ability to apply concepts in new contexts.

PROJECT-BASED LEARNING IN PRACTICE: AN INTEGRATED BAKERY MODEL

At Toi Ohomai Institute of Technology, project-based learning is woven into the baking curriculum through a weekly, student-run retail bakery on campus. Learners in the New Zealand Certificate in Baking (Level 4) rotate systematically through inventory control, customer service, and production planning, while those in the New Zealand Diploma in Baking (Level 5) move into supervisory roles. Diploma students mentor their junior peers. They manage daily operations and assume full responsibility for wage calculations, product costings, and financial reporting. This deliberate scaffolding ensures that technical skills develop in tandem with the managerial and interpersonal capabilities required in a commercial setting.

Soft skills are thus treated as essential outcomes, not incidental by-products. Within the PBL framework these skills are explicitly taught and rigorously assessed. Teamwork is fostered as students coordinate live production schedules under time pressure; problem-solving emerges when they confront ingredient shortages or special-diet requests and record their decisions in reflective logs, and leadership is cultivated as senior learners manage shifts and coach their colleagues. Detailed rubrics, peer- and self-assessment, and 360-degree feedback loops render these behaviours visible and measurable, embedding critical thinking, creativity, communication, and collaboration—Levin-Goldberg's (2012) "4 Cs"—at the heart of the programme. Regular industry placements complete the cycle by showing students how classroom-honed capabilities map directly onto professional practice.

ADAPTING PROJECT-BASED LEARNING UNDER PANDEMIC DISRUPTION

COVID-19 lockdowns forced a rapid redesign of the campus retail bakery, yet the PBL ethos remained intact. Face-to-face trading was replaced by a contact-free "click-and-collect" model that mirrored the adaptations of commercial bakeries nationwide. Diploma students processed online orders, scheduled socially distanced production teams, enforced public-health protocols and organised safe customer pick-ups. Certificate students supported these operations remotely, ensuring continuity of learning across both cohorts.

Learners documented every procedural decision, adaptive strategy, and collaborative effort in digital portfolios. Each entry required them to narrate the experience, reflect on outcomes, connect insights to theory, and plan their next experiment—an explicit enactment of Kolb's (1984) experiential learning cycle. These portfolios both satisfied assessment criteria and reproduced the experience of responding to the operational volatility of the pandemic era, reinforcing the programme's shift from narrow competency testing to genuine capability building.

IMPLICATIONS OF EMBEDDING PROJECT-BASED LEARNING WITHIN CAMPUS LEARNING ENVIRONMENTS

Although project-based learning has been widely lauded for deepening engagement and cultivating transferable capabilities, embedding it in vocational settings such as bakery education also reveals a series of challenging realities. At an institutional level, purpose-built training kitchens rarely mirror the immediacy, unpredictability, and throughput of a commercial bakery. Timetables are fixed to semester blocks, equipment usage is shared across programmes, and strict health-and-safety protocols restrict the spontaneous workflow changes that give real-world commercial production its edge. Procuring ingredients at pedagogically opportune moments is equally fraught: procurement cycles, budget ceilings, and storage limitations can prevent learners from experiencing authentic supply-chain volatility—the very context in which adaptability is most keenly tested. Collectively, these structural constraints risk reducing PBL to a series of staged exercises rather than the fluid, client-driven projects envisaged by its advocates.

Pedagogical demands present an additional layer of complexity. Project-based learning requires educators to relinquish the comfort of directive instruction and assume the role of facilitator, coach, and critical friend—shifting from "sage on the stage" to "guide on the side" (Boud & Feletti, 1997, p. 4). Such a pedagogic transformation is neither automatic nor trivial: tutors steeped in product-outcome-centred demonstration must master new skills in supporting learning through failure, while also safeguarding food safety and production quality.

Class size can also compound difficulties around the implementation of project-based learning. For instance, my own class cohort of 17 learners exceeds the staffing level of many artisan bakeries, diluting the realism of the learning environment and constraining opportunities for authentic, hands-on engagement. Taken together, these institutional, pedagogical, and logistical factors illustrate why translating the promise of PBL into vocational bakery curricula is far from straightforward.

CONCLUSION: TOWARD A RECALIBRATED CURRICULUM

In light of an evolving industry and the limitations of traditional competency-based models, it is clear that there is a role for project-based learning bakery education in Aotearoa New Zealand. Drawing on over four decades of international industry experience, I have seen firsthand how the complex realities of contemporary baking demand more than technical precision—they require adaptability, critical thinking, collaboration, and leadership. Although embedding PBL presents logistical and pedagogical challenges, the benefits far outweigh the constraints. If we are to prepare learners for the uncertainties of the bakery industry and of our world more broadly, then PBL must move from the margins of our programmes to become its foundation.

Noel Remacle is a third-generation Belgian baker with over 40 years of experience. He has mastered traditional craft, led global product development, and now shapes future pastry chefs at Toi Ohomai and Pharos University in Alexandria. Always learning, he is pursuing a master's while sharing his passion through teaching, social media, and hands-on industry experience.

REFERENCES

Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist, 26*(3–4), 369–398. https://doi.org/10.1080/00461520.1991.9653139

Boud, D., & Feletti, G. (Eds.). (1997). The *challenge of problem-based learning* (2nd ed.). Kogan Page.

Darling-Hammond, L., Barron, B., Pearson, P. D., Schoenfeld, A. H., Stage, E. K., Zimmerman, T. D., Cervetti, G. N., & Tilson, J. L. (2008). *Powerful learning: What we know about teaching for understanding*. Jossey-Bass.

Hager, P., & Holland, S. (2006). *Graduate attributes, learning and employability*. Springer.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, *16*(3), 235–266. https://doi.org/10.1023/B:EDPR.0000034022.16470.f3

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Levin-Goldberg, J. (2012). Teaching generation techX with the 4Cs: Using technology to integrate 21st century skills. *Journal of Instructional Research*, *1*, 59–66. https://files.eric.ed.gov/fulltext/EJ1127608.pdf