Developing Teacher Performance Indicators for 21st Century Competency-Oriented Teaching and Learning: Implications From IB Philosophy and Practices

Hsiao-Lan Sharon Chen, Helen Jou, Shi-Ping Lin, Iwan A. J. Sianturi

Abstract

Purpose

As the global trend, there have been great demands for preparing teachers with professional vision and capacities for 21st century teaching and learning. In Taiwan, due to the newly reformed 2019 competency-oriented curriculum with all its necessary renewal of pedagogical practices, there have also been enormous calls and emphasis for

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the cultivation of 21st century knowledge, skills and dispositions within teachers. Since the International Baccalaureate programs already reflect many essential pedagogical principles of teaching for 21st century skills in its philosophy and practices, many education stakeholders have considered exploring these IB principles for their applicability to 21st century competency-oriented teaching and learning demands. Drawing on implications from IB philosophy and practices, this study aims to develop a framework of teacher performance indicators that promotes quality teaching and learning for 21st century skills. It is intended, in this paper, to explore the essential features of 21st century teaching and learning; to address reflectively on the dynamic procedures and methods applied in the construction of teacher performance indicators; and to provide suggestions on utilizing the framework for teacher appraisal and professional development.

Main Theories or Conceptual Frameworks

Not applicable.

Research Design/Methods/Participants

In order to draw implications from IB philosophy and practices for the construction of indicators for 21st century competency-oriented teaching performance, in this study– in addition to analyzing IB documents- group judgment techniques, including panel discussion, focus group interview, and Delphi survey, were employed to extract views and feedback from experienced IB practitioners as well as a panel of IB experts. After the framework of teacher performance indicators was constructed, field tests were conducted among local non-IB teachers to assess the appropriateness and applicability of the framework.

Research Findings or Conclusions

To make the framework more effective for preparing teachers with capacities for 21st century teaching and learning, we learned from the IB experts and practitioners that the performance indicators must be grounded in the 21st century skills and

competencies– emphasizing holistic development of abilities and skills not only in the cognitive domain (e.g., critical thinking, inquiry-based learning) but also in the interpersonal and intrapersonal domains (e.g., communication, collaboration, self-management, cultural awareness); and stressing reflective cultivation of the dispositions of open-mindedness and flexibility. To prevent confusion and misapplication of the framework, it is important, through group deliberation processes among stakeholders, to establish a consensus on the connotation and interpretation of performance standards and indicator items. Further, to implement the 21st century teaching performance indicators framework more constructively, as teachers stressed, the framework should be contextualized and used in a positive, nonjudgmental, teacher-directed manner rather than in an external or top-down manner, and it should be introduced as a diagnostic tool for identifying strengths and limitations and for building professional growth plans by and for teachers.

Theoretical or Practical Insights/Contributions/Recommendations

This study is a preliminary effort in Taiwan's research on developing teacher performance indicators for teaching 21st century competency-oriented curriculum. The final framework of "Teacher Professional Standards and Performance Indicators for 21st Century Competencies" derived from this study can provide reference for the planning of education programs for teacher professional development, and be used as an appraisal medium to assess, monitor, and improve teachers' performance and capacities in teaching. It is believed that this framework can be adopted in IB school systems, schools in Taiwan and in other geographical locations, spurring the creation of practical international analogues and thus assisting in the understanding of teacher capacities required for 21st century teaching across the globe.

21世紀素養導向教學教師表現指標之發展：來自IB教育理念與實務的啟示

甄曉蘭、李秀芬、林曦平、Iwan A. J. Sianturi

摘要

研究目的

　　在全球化趨勢下，培養學生核心素養與能力成為各國教育關注的焦點，再加上臺灣108素養導向課綱的推動實施，使得培育具全球視野、能勝任核心素養導向教學的教師需求劇增。由於國際文憑（International Baccalaureate, IB）課程的理念與實踐反映了極為深厚的21世紀素養教學重要原則，許多教育利害關係人已考量從IB的教學原則來探尋回應素養導向師資教育需求的適用性。借鑑IB教育理念與實務所獲得的啟示，本研究旨在發展一個教師表現指標架構，以促進培養21

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世紀素養的優質教與學。基於此，本文特別探討21世紀教與學的要素，反思論述本研究建構教師表現指標的動態程序和所採用的方法，並就運用表現指標架構來促進教師的專業發展提出相關建議。

主要理論或概念架構

　　不適用。

研究設計／方法／對象

　　為發展21世紀素養導向的教學表現指標，本研究除了透過分析IB文件汲取IB理念與實務的相關啟示外，還特別運用群體評判決議技術，包括專家小組討論、焦點團體訪談和德爾菲調查，來蒐集IB實務工作者與學者專家的意見與回饋，據以訂定教師表現指標內涵。完成定稿後，再對在地非IB教師進行測試，藉以評估指標架構的適切性和適用性。

研究發現或結論

　　為使教師表現指標架構能有效地培養教師具備21世紀教學能力，IB專家和實務工作者指出，表現指標的制定必須植基於21世紀的能力素養——特別強調能力素養的全面發展，不僅在認知領域（如批判性思考、探究式學習），更在人際和內在領域（如溝通、協作、自我管理、文化意識），並且要著重反思性、開放性及彈性特質的養成。為避免對指標架構的誤解或誤用，對教師表現標準和指標項目內涵的理解與詮釋，必須透過利害關係人參與團體審議過程來達成共識。此外，為更具建設性地使用21世紀教學表現指標架構，教師們強調指標架構必須要脈絡化，並以正向、非評斷、教師主導的方式來運作，而不是從外部或由上而下的方式來實施，且應以診斷工具的形式導入，用來釐清教師教學的優勢和限制，讓教師得以為其個人訂定專業成長計畫。

理論或實務創見／貢獻／建議

　　本研究開啟了實施21世紀素養導向課程教師必備之教學表現指標的探討與發展，所建構的「21世紀教師專業標準與績效指標」架構，不僅可作為教師專業能力發展方案的規劃參考，更可作為評估、監測及提升教師教學能力與表現的媒介。而這樣的教師表現指標架構不僅適用於IB學校系統，亦可應用於臺灣及其他

地區的所有學校，並可藉以激發國際上相關的研究與討論，進一步瞭解並提升教師在21世紀養導向教學中的視野與能力。

關鍵詞：21世紀教與學、素養導向課程、IB理念與實務、教師評鑑、教師表現指標、教師專業發展

Introduction

With the pressing goal of preparing students for the competencies needed for life and work in the 21st century, many countries and educational systems around the world have undertaken extensive educational reforms to redefine curriculum priorities and to make changes to their policy pathways (Adamson & Darling-Hammond, 2015; Chang, 2017; Halász & Michel, 2011). Consequently, educational stakeholders worldwide are challenged to design and implement teaching and learning objectives that promote the development of future student competencies and skills. Although many studies have cogently presented what students should acquire to function in the 21st century society (e.g., Kereluik et al., 2013; Organisation for Economic Co-operation and Development / Asia Society, 2018; Voogt & Roblin, 2012), little is offered regarding the facilitation of and support for the development of these essential objectives. The practical needs of educators currently in the classroom as well as those in teacher education programs who are or will be tasked with meeting those objectives must be taken into account. It is imperative that more attention should be given to the central role of teachers in the implementation of 21st century competencies and skills and the consequent need for teacher professional development (Pellegrino, 2017; Schleicher, 2012; Voogt & Roblin, 2012).

In Taiwan, influenced by global trends, there have also been structural changes and curriculum reforms (Chen & Huang, 2017). These have led to demands not only for the development of 21st century knowledge and skills but more crucially for the cultivation of that knowledge and those skills and dispositions within teachers as they strive to implement the newly reformed 2019 competency-oriented curriculum with all its necessary renewal of pedagogical practices. Proponents of 21st century teaching and learning continue to establish and embrace the opportunity for positive changes in the approaches to teaching and learning as well as teachers' pedagogical principles and disposition (Appleyard & McLean, 2011; Ryan et al., 2014), but how schools and

teachers should respond to the calls for designing teaching and learning that embed the 21st century competencies and skills remains an open question. In response to the urgent need for preparing competent 21st century teachers, it is important to profile the pedagogical knowledge and practice of 21st century quality teaching, and then to develop a framework of performance indicators featuring looked-for teaching capabilities that will enable teachers to guide and promote their own professional growth toward becoming more capable, more promising 21st century teachers.

Drawing on empirical research that confirms the success of International Baccalaureate (IB) programs worldwide (e.g., Coca et al., 2011; Ryan et al., 2014) and their rapid growth across the globe, many stakeholders in education have focused on these successful programs to try to discover in their effectiveness those classroom applicabilities with 21st century relevance. According to the IB mission statement, their programs aim to prepare students to be inquirers, knowledgeable, thinkers, communicators, and principled, open-minded, caring, risk-takers who are balanced and reflective (International Baccalaureate Organization [IBO], 2008a). These aims are consonant with 21st century competencies and skills (Kereluik et al., 2013; Voogt & Roblin, 2012). The underlying teaching and learning philosophy of IB with its pedagogical principles and practices offers a model for the essential features that should be considered when constructing 21st century teaching and learning performance indicators. As more schools around the world turn to IB programs to prepare students for the global scene with 21st century competencies and skills, the National Taiwan Normal University (NTNU), a leading university in teacher education in Taiwan, adopted the International Baccalaureate Education Certificate (IBEC) programs since 2018 as alternatives to revitalize teaching practices for pre- and in-service teachers. Being involved in teaching and observing the IB Philosophy and Practices course in the IBEC programs at NTNU, we were enthused to have further exploration of the implications of applying IB pedagogical philosophy, principles and practices for competency-oriented teacher training and professional development. Ultimately, it would help us identify teacher performance indicators for 21st century teaching and

learning.

Accordingly, this study was designed to identify the essential indicators of quality teaching in IB programs that can be used in generating implications for preparing teachers with 21st century teaching skills and to construct a framework of teacher performance indicators for teacher appraisal that can facilitate 21st century competency-oriented teaching and learning. In this paper, we will first briefly discuss the essential features of 21st century teaching and learning; then, we will introduce the procedures and methods applied in the construction process; and finally, based on teachers' reactions towards the framework, we will address lessons learned from the construction process and provide suggestions on utilizing the framework for teacher appraisal and professional development.

Essential Features of 21st Century Teaching and Learning

The call for 21st century teaching and learning, initiated by several international organizations (e.g., OECD, 2005, 2018; United Nations [UN], 2015; United Nations Education Scientific and Cultural Organization [UNESCO], 2014), involves a very different set of student competencies and skills in order for them to function effectively at work in the future. Extensive research and numerous publications have pointed out the substance, value, and practical approaches in those documents and frameworks (e.g., Griffin et al., & Care, 2012; Halász & Michel, 2011; Lemke, 2002; OECD / Asia Society, 2018; Partnership for 21st Century Skills, 2009; Pellegrino, 2017; Schleicher, 2012; Voogt & Roblin, 2012). A general consensus holds that teachers' expertise and professionalism are closely linked to subject matter knowledge, didactical knowledge (knowing how to teach their subject matter to others), pedagogical knowledge (knowledge about how children learn, feel, and develop), self-awareness and social skills, and organizational competence (Christie, 2003; Smith, 2005). Voogt and Roblin (2012), for example, analyzed eight frameworks of 21st century competencies and

skills looking specifically at their underlying rationales and goals, the definitions of competencies, and the recommended strategies for implementation and assessment of these skills. The results suggest similar emphasis of these competencies across the eight frameworks, with only small differences in categorizing and grouping of the competencies and skills. Most of the frameworks highlight abilities such as communication, collaboration, ICT-related skills, and social and/or cultural awareness. Aptitudes for creativity, critical-thinking and problem-solving are also favorably noted (Voogt & Roblin, 2012). Additionally, five cross-curricular key competencies: digital competence, learning to learn, social and civic awareness, sense of initiative and entrepreneurship, and cultural awareness and expression are highlighted by the European Framework as strategically important (Halász & Michel, 2011).

　　With the worldwide educational goal of teaching for 21st century skills and core competencies, the demands placed on teachers are indeed very high. Teachers are not only expected to assist their students in acquiring these skills and competencies; they are also expected to possess these competencies themselves (Voogt & Roblin, 2012). Consistent with Voogt and Roblin's findings, Kereluik et al. (2013) pointed out a commonality among 15 knowledge frameworks of 21st century learning, which can be grouped under three overarching categories: Foundational, Meta, and Humanistic Knowledge. They assert that what students need to know (foundational knowledge), how they act on that knowledge (meta knowledge) and the values they exhibit in their actions (humanistic knowledge) are still the core concerns of successful practice in 21st century teaching and learning. However, because of the dramatic developments in information technology in recent years, approaches to teaching and learning have been fundamentally changed. More than ever, teachers are facing a new world where ICT-related capability plays a vital role in determining students' access to knowledge, representation of their knowledge, and re-purposing of that knowledge. Meanwhile, as interpersonal relationships grow, cultural competence and self-regulation have also become crucial.

This competency-oriented turn in teaching and learning represents a paradigm shift from a teacher-centered perspective to a more student-centered one. The traditional emphasis on subject-content knowledge is being replaced by new approaches, ones in which teachers must embrace that newness and adjust their personal beliefs accordingly; further, they must obtain deeper understanding of curriculum design, adapt to the new teaching culture, and provide various novel learning opportunities and teaching practices to students in order to prepare them with the requisite 21st century competencies and skills. In other words, teaching and learning in the 21st century require high-quality teachers who not only help students to obtain these essential competencies but are also masters of these competencies themselves. Obviously, the demands are great to develop teachers' abilities to use various teaching methods/strategies and assessment procedures, to identify the connections (interdisciplinary themes) between core subjects (curriculum map) and 21st competencies as well as to develop teachers' capacities to make use of the prodigious potential of ICT tools to create learning environments.

Many countries share a substantial common interest in changing the landscape of education by promoting and developing the ideas that have come to be labeled as "21st century learning." To understand the priorities of 21st century learning, it is important to consider the main concerns of teachers and teacher educators. For instance, Pellegrino and Hilton (2012) identify three broad domains of competency to be developed in 21st century teaching and learning: the cognitive (cognitive processes and strategies, knowledge, and creativity), the intrapersonal (intellectual openness, work ethic and conscientiousness, and self-regulation), and the interpersonal (teamwork, collaboration, and leadership). It is worthwhile to note the similar approach of Kereluik et al. (2013), above, who have mapped a synthesis of 15 different 21st century learning frameworks into: foundational knowledge (digital/ICT literacy, core-content knowledge, cross-disciplinary knowledge), meta knowledge (problem solving and critical thinking, communication and collaboration, creativity and innovation), and humanistic knowledge (life/job skills, leadership, cultural competence, ethical/

emotional awareness). Thus, in many respects, all teachers are encouraged to embed the aforementioned features in their teaching and learning. Although it would be unrealistic to expect all teachers to model all of these concepts, trans-disciplinary themes that embody many or most of these objectives should inevitably generate a complementary development of them in their students.

High student test performance in reading literacy, mathematics, and science in East Asian countries (including Taiwan) has attracted policymakers from many countries, and these policymakers have attempted to borrow East Asian "best practices" of teaching and learning to replicate those high-performance achievements (You, 2019). However, education in the East Asian region has often been criticized for the phenomenon of high student test scores but low student practical skills (Liu & Neilson, 2011). To rectify this phenomenon, it is therefore critical to identify pedagogical principles that will help students not only to exhibit high performance on international tests but also to develop the concomitant 21st century competencies and skills. Public enthusiasm for IB schools validates their pedagogical philosophy of inquiry-based, concept-driven, contextualized, collaborative, differentiated instruction, informed by assessment (IBO, 2013), intertwined with strategic opportunities for developing 21st century student competencies and skills. IB schools are marketed as building 21st century cognitive skills related to reasoning and thinking (e.g., creativity, critical thinking, problem-solving) and 21st century non-cognitive skills related to the interpersonal and intrapersonal capacities (e.g., intellectual openness, work ethic, conscientiousness, communication, leadership, and time management) (Ryan et al., 2014; Wright & Lee, 2014). Though there might be criticisms on the performative rhetoric and the limits of IB programs, it is evident that IB makes a difference at the level of IBDP teacher pedagogy and student learning and self-formation, encouraging a transitional and plural space for authentic relationship building, thinking for oneself in relation to others' knowledge and expectations, and supporting a "relational autonomy" approach for dynamic community co-learning (Lyons & Tarc, 2024). As Renaud argues compellingly in support of the wisdom of the IB pedagogical model:

> The responsibility of educators is no longer just to prepare good mathematicians, good biologists or good historians. The mission of schools is to prepare young people– decision makers of tomorrow– to live in a complex multicultural society undergoing a rapid process of change and opening up a new world order…. Even more important is the acquisition of attitudes in the learning process in a context of cultural exchanges. (Renaud, 1991, quoted in IBO, 2008b, p. 12)

In this regard, Renaud can be said to assert the conclusion that students in IB schools are being prepared not only for exhibiting creditable academic performances but also for developing maps for their life-journeys in which key 21st century competencies and skills are embedded. Teachers in IB schools are required to design teaching and learning plans based on the IB pedagogical principles of inquiry, which are focused on conceptual understanding, developed in local and global contexts, founded on effective teamwork and collaboration, differentiated to meet the needs of all learners, and informed by formative and summative assessment, with the goal, always, of graduating knowledgeable, inquiring, principled, open-minded, caring risk takers who are also balanced and reflective thinkers and communicators (IBO, 2014; Ryan et al., 2014). Reflecting on the "Teacher Professional Standards and Performance Indicators" in Taiwan (Chen, 2014; Ministry of Education, 2016), though covering the dimensions of "knowledge base" (educational foundation, pedagogical content knowledge), "professional practices" (instructional design, pedagogical practice, assessment for learning, learning environment, student counseling and guidance), and "professional engagement" (professional responsibilities, professional development, collaboration and leadership), the needed teaching capacities for inquiry based teaching and learning, conceptual understanding, international mindedness and culture awareness are missing. Based on these points, we argue that the construction of teacher performance indicators for 21st century teaching and learning can be built upon the implications from IB philosophy and pedagogical practices that would develop students with apposite 21st century competencies and skills needed for success.

Methodology and Reflective Construction Process

Eliciting opinion from expert panels has become a common method of selecting criteria to define quality of a profession and in support of decision making for public policy (Hemming et al., 2018; Meyer & Booker, 2001). In the context of developing measures of quality teaching, many educational researchers have employed group judgment techniques (e.g., Delphi survey, panel discussion), combined with information from different resources (e.g., literature, synthesized guidelines, teacher evaluation standards) to make recommendations regarding appropriate teaching performance (e.g., Chen, 2014; Chen & Liu, 2023). In order to draw implications from IB philosophy and practices for the construction of teacher performance indicators, in this study– in addition to analysis of IB documents– panel discussion, focus group interview, and Delphi survey research methods were also applied to extract views and feedback from experienced IB practitioners as well as a panel of IB experts. Then, field test approaches were conducted among local non-IB teachers to assess the appropriateness and applicability of the constructed performance indicators in a Taiwan context. To highlight the construction process involved continuous critical reflections in the development of these teacher performance indicators for 21st century teaching and learning, we enumerate the four stages, combined with methods and reflective learning from the IB experts and experienced practitioners, as follow:

Stage 1: Formulating Performance Indicators (08/2018~07/2019)– based on IB document analysis, and collaborative panel discussions with cross-national researchers, IB experts, and experienced practitioners

In the first year of study– being invited to participate in a local IB school's (Taipei Kuei Shan School/KS) teacher evaluation project with the Stanford Center

for Assessment, Learning and Equity (SCALE)– we set our research goals to clarify to what extent and in what ways IB pedagogical practices differ from traditional teaching practices in the fostering of 21st century skills; to examine the required knowledge, skills, and disposition of a competent IB teacher; and to identify the set of 21st century competence-related performance measures of a capable IB teacher. During the cross-national collaborative process, through school visits, conferences, and panel discussions, there were opportunities to interact with IB school coordinators and teachers, international scholars, and IB leaders to discuss and to construct the target performance measures. Based on our analysis of IB documents and related literatures, panel discussions (n=9) with the KS-SCALE research team (n=5+4), and discursive interactions with IB school teachers (n=6) and coordinators (n=2), we found that, besides the six pedagogy principles of Approaches to Teaching (ATT) being addressed in IBDP document, there was no existing IB teacher performance indicators being developed. Therefore, we fabricated some guidelines based on IB philosophy and approaches to teaching and learning, such as be Learner Profile oriented, to be guided by ATT pedagogical principles, and to be connected to Approach to Learning (ATL), to direct our initiative thinking in identifying and constructing IB teacher performance indicators (see Figure 1). Then, through cross-referencing and synthesis of opinions from different expert panels, we identified 10 potential performance measures/standards out of the KS-SCALE's 19 dimensions of IB Teacher Evaluation Criteria Framework and formulated a tentative structure of competency-oriented performance indicators for further examination and construction.

Stage 2: Revising Performance Indicators (08/2019~01/2020)– based on IB practitioners' concerns revealed through focus group interviews with experienced IB teachers and coordinators

Learning from the first years' collaborative exploration experience with the KS-SCALE team, we found that there were varied expectations for the development of the

Figure 1

Guidelines for Constructing IB Teacher Performance Indicators
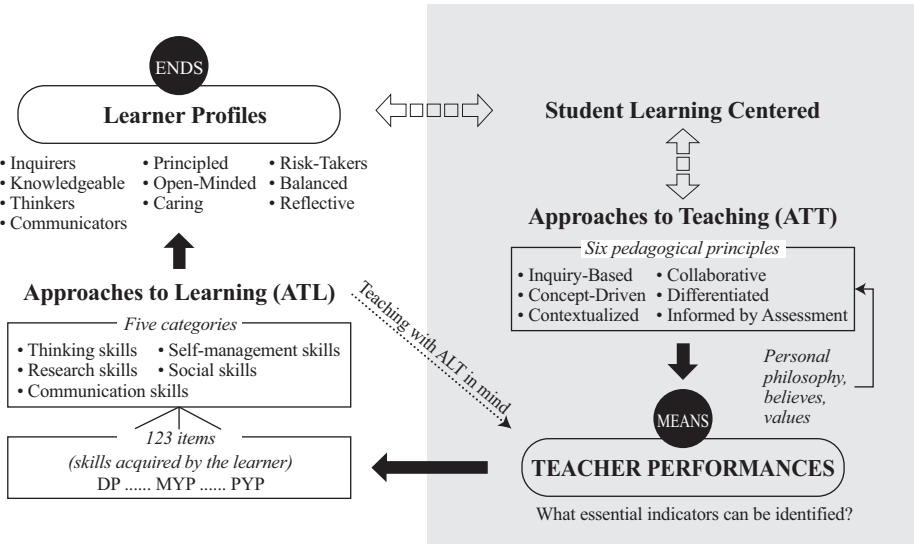
Note. Developed by NTNU research team.

teacher performance indicators among stakeholders. We realized that in order to make the performance indicators framework more thorough, promising and consensual, IB practitioners' concerns must be taken into serious consideration. Based on the concerns raised by participant IB teachers and teacher trainers during the first year of study, in the second stage of revision, our internal research meetings started with reconstructing the overall framework. First, we focused on two essential questions: "How to relate the indicators to the larger goals of teaching for 21st century skills, e.g., interdisciplinary thinking, inquiry-based learning?" and "How to organize the interrelated indicators into a more understandable, easier-to-delineate skills format?" After a more complete reconstructed version was prepared, we organized two focus group interviews (one for IB coordinators, one for experienced IB teachers) and invited expert IB practitioners (n=3+6 from three different international IB schools) to provide their views on quality teaching performances of IB teachers and to share their concerns and suggestions on

our reconstructed performance indicators. Based on their concerns and suggestions, in many deliberative meetings, we further reorganized the indicators and modified some of the descriptions with more precise language to give more clarity for teacher practice, guidance, and improvement. Then, this more complete "Teacher Professional Standards and Performance Indicators for 21st Century Competencies" was sent to elicit IB expert opinion from local and foreign sources, via Delphi survey as reference, to fine-tune our standards toward further finalization.

Stage 3: Finalizing Performance Indicators (02/2020~07/2020)– based on Delphi survey

After our "Teacher Professional Standards and Performance Indicators for 21st Century Competencies" had been further refined, we sent out surveys to the IB program leaders, coordinators, and coach teachers, local and foreign, to collect feedback and revision suggestions using the Delphi method. The survey was sent in April to a panel of 15 experts, including eight from three different IB schools in Taiwan and seven from abroad (four from Hong-Kong, two from Canada, and one from Thailand). The data collection process ended in mid-May, and 13 valid surveys were received (87%). The survey results showed that the participants responded highly positively to the "Teacher Performance Standards and Indicators" that we developed; among the 10 standards, eight received above an 85% degree of agreement from the respondents, while two received a lower 69%-77%. On the indicators, the survey respondents also showed a high degree of agreement. Of the 30 performance indicators, half of them were agreed to by the entire panel, while the rest of the indicators received an above 85% degree of agreement (see Table 1).

Table 1

Respondents' Agreement to the Performance Standards and Indicators

		Standard			Indicators 1			Indicators 2			Indicators 3		
		Agree	Partially agree	Disagree	Agree	Partially agree	Disagree	Agree	Partially agree	Disagree	Agree	Partially agree	Disagree
Standard 1	#	9	4	0	13	0	0	12	1	0	12	1	0
	%	69%	31%	0%	100%	0%	0%	92%	8%	0%	92%	8%	0%
Standard 2	#	10	3	0	11	2	0	11	2	0	11	2	0
	%	77%	23%	0%	85%	15%	0%	85%	15%	0%	85%	15%	0%
Standard 3	#	12	0	1	11	1	1	13	0	0	13	0	0
	%	92%	0%	8%	85%	8%	8%	100%	0%	0%	100%	0%	0%
Standard 4	#	11	2	0	12	1	0	11	2	0	13	0	0
	%	85%	15%	0%	92%	8%	0%	85%	15%	0%	100%	0%	0%
Standard 5	#	11	1	1	11	2	0	11	2	0	12	1	0
	%	85%	8%	8%	85%	15%	0%	85%	15%	0%	92%	8%	0%
Standard 6	#	12	1	0	13	0	0	13	0	0	13	0	0
	%	92%	8%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Standard 7	#	11	2	0	12	1	0	12	1	0	12	1	0
	%	85%	15%	0%	92%	8%	0%	92%	8%	0%	92%	8%	0%
Standard 8	#	12	1	0	13	0	0	13	0	0	13	0	0
	%	92%	8%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Standard 9	#	11	2	0	11	2	0	13	0	0	13	0	0
	%	85%	15%	0%	85%	15%	0%	100%	0%	0%	100%	0%	0%
Standard 10	#	12	1	0	13	0	0	13	0	0	13	0	0
	%	92%	8%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%

Taking into consideration the feedback from the Delphi survey, we drew up a revised rationale for each standard and had the amended versions sent out for external review and fine-tuning by two experienced international-school foreign teachers and finally completed the development of our "Teacher Professional Standards and Performance Indicators" (see Table 2).

Table 2

Finalized Teacher Performance Standards and Indicators

Standards	Indicators
STANDARD 1 Drawing on students' prior knowledge and experience to prepare their readiness for new learning and asking thought-provoking questions to foster students' curiosity and to scaffold their thinking and inquiry.	1. Eliciting student responses relative to life experience and examples connected to previous learning. 2. Asking different types of questions that stimulate curiosity and engagement. 3. Demonstrating skills in asking high-order questions to scaffold, refine, and extend thinking and inquiry.
STANDARD 2 Designing and implementing concept-driven learning activities to facilitate deeper understanding, and encouraging students to pose questions and to apply knowledge and skills in exploring local/global issues across disciplines.	1. Demonstrating appropriate approaches and presenting relevant materials/media in learning activities that foster conceptual understanding. 2. Modeling and making connections to real-life problems and issues in local/global contexts across disciplines. 3. Involving students in self-evaluation of their understanding and construction of their questions and solutions.
STANDARD 3 Supporting students to use different languages/forms/media to express and exchange ideas and perspectives effectively with different audiences for intended purposes	1. Allowing students to use different languages and representations to express and exchange ideas and points of view effectively. 2. Encouraging students to apply different forms and media to present their ideas and perspectives. 3. Providing opportunities for students to exercise multiple communication skills for different purposes with different audiences.
STANDARD 4 Preparing students with critical-literacy skills to search for, interpret, and evaluate information from multiple resources ethically for generating novel ideas and solving complex problems independently and collaboratively.	1. Discussing the importance of academic honesty and providing guidelines for searching for, selecting, and evaluating information from different sources. 2. Guiding students to apply ethical principles in using, analyzing, and interpreting information. 3. Facilitating critical thinking in applying information selected, in generating novel ideas, and in solving problems independently and collaboratively.

(Continued)

Standards	Indicators
STANDARD 5 Taking into account the diversity of students' social, cultural, and language backgrounds in teaching and learning to foster students' identities as well as their intercultural understanding and respect.	1. Providing opportunities that encourage students to share their family traditions, values, and cultural experiences.
	2. Demonstrating positive attitudes toward students' diverse social, cultural, and language backgrounds to support their identity development.
	3. Creating activities that nurture appreciation and respect for their own and others' socio-cultural traditions and values.
STANDARD 6 Understanding and being responsive to different interests, strengths, and special needs of students as well as supporting them to develop, pursue, and achieve their personal learning goals.	1. Using multiple existing assessment tools and evidence to identify students' interests, strengths, and special needs in and for learning.
	2. Implementing differentiated and responsive instructions to meet students' diverse learning needs.
	3. Providing guidelines and support that help students to set and achieve their personal learning goals.
STANDARD 7 Designing and implementing various assessment tasks and criteria, aligned with stated learning objectives and intended outcomes, to ensure students' continuous learning and growth.	1. Designing and utilizing different assessments and criteria aligned with learning objectives and expected outcomes.
	2. Implementing assessment tasks to scaffold students' learning performance and to help students learn how to learn.
	3. Providing opportunities for students to self-assess, monitor, and adjust their own performances for improvement.
STANDARD 8 Providing opportunities and feedback to help students identify and reflect on their strengths and weaknesses and become responsible for planning, managing, and assessing their own learning.	1. Providing evidence-based feedback on students' learning performances.
	2. Involving students in self-assessment that helps them to reflect critically on their learning and to identify their strengths and weaknesses.
	3. Providing concrete suggestions that guide students to become more responsible for planning and managing their own learning.

Standards	Indicators
STANDARD 9 Establishing a safe, supportive, and collaborative learning environment and climate by providing guidelines/ routines, resources, and consultation to engage students in effective learning.	1. Working with students to co-construct classroom learning guidelines/routines.
	2. Creating and maintaining a safe and friendly environment/ climate that supports classroom discussions and collaboration.
	3. Providing sufficient resources and consultation to promote student agency and productive learning.
STANDARD 10 Working collaboratively, engaging in professional development continuously, and demonstrating pedagogical leadership in action with open-mindedness and flexibility.	1. Working collaboratively with students, colleagues, and parents for students' learning development.
	2. Engaging in various professional development that promotes continual personal and professional growth.
	3. Being open-minded and flexible toward change and being willing to take active roles in innovative pedagogical practices.

Further, the findings of the Delphi survey also showed that the responding teachers and coordinators had similar ideas about the types of suggested supporting evidence for the teacher professional standards and performance indicators. For example, in standards one, two, four, seven, and eight, all respondents considered "documents" (including lesson plans, worksheets, etc.) are necessary evidence; in standard one, all respondents agreed that "class observation" should be mandatory.

Stage 4: Field-testing Performance Indicators (08/2020~07/2022)– through teachers' self-assessment and focus group interviews

After the "Teacher Professional Standards and Performance Indicators for 21st Century Competencies" was firmed up for field test, we used it as a self-assessment tool– "Self-reflection on Teaching"– in the "IB Philosophy and Practice" course of NTNU IBEC program in the school years of 2020 and 2021 for participant in-service

teachers (n=30+26) to evaluate their own teaching performance, before and after the class. By doing so, we expected that the participant non-IB in-service teachers, who took the course to prepare themselves to become IB teachers, would gain understanding and enhance their capacity for professional growth in 21st century teaching and learning methodology. The results of the pre- and post-self-assessments showed that most teachers considered themselves performing competently in "creating and maintaining a safe and friendly environment that supports learning" (9-2), "helping students make connection to life experience and previous learning" (1-1), and "being open-minded and flexible toward change" (10-3). The ones they considered themselves not doing so well in and needing improvement in were "providing opportunities for students to exercise communication skills" (3-3), "involving students in construction of their questions and solutions" (2-3), "involving students in self-assessment that will help them become responsible for their own learning" (8-2), and "discussing the importance of academic honesty and providing guidelines (4-1).

Also, with the intent to explore possible ways of incorporating the "Teacher Professional Standards and Performance Indicators for 21st Century Competencies" into teacher professional development programs in Taiwan, in this final stage, we not only translated the whole framework into Chinese but also conducted three focus group interviews with experienced local high school teachers. The first group was with IBEC program participant high school teachers (n=6); the other two were with high-school teacher leaders from different subject areas (n=9+6). We tried to elicit their opinions on our delineated 21st century competence-based performance indicators and to invite them to share their reactions to the use of those indicators in assessing teacher performance for professional development. They admitted that most teachers, even themselves, still lacked knowledge, skills, and mindset for competence-oriented teaching and did not have sufficient questioning skills to scaffold, refine, and extend students thinking and inquiry. They particularly pointed out that, being influenced by the local long-existing, exam-oriented, teacher-centered knowledge transmission culture– in contrast with IB schools– the teaching context in most local schools could hardly

support the development of 21st century teaching and learning. Regarding the use of the performance indicators for teacher professional development, they suggested that the performance indicators framework could be used as a professional-development guidance tool for novice teachers and as a continuous self-assessment tool to trace veteran teachers' professional growth. They also pointed out that it must be employed in a more systematic way with more thoughtful concerns, such as considering needed subject-based modifications to meet varied performance requirements in different subject-teaching situations, and required school-based modifications to guide teacher professional growth in various developmental stages.

Being teacher educators and educational researchers involved in teacher-training programs, and knowing the aforementioned information from IBEC participant teachers' self-assessment practice, has helped us be more cognizant of where and how to improve our course design and pedagogical practices to enhance teachers' teaching capacities for the needed competencies and skills. Furthermore, from local teachers' opinions and reactions to the competence-oriented performance indicators, we not only obtained feedback for refinement of both the English and Chinese versions, providing descriptions of our rationale (See Appendix: Teacher Professional Standards and Performance Indicators for 21 Century Competency-oriented Teaching and Learning / "21世紀素養導向教學教師專業標準與表現指標"), but we also received constructive feedback for further thinking about the feasibility of using the indicators for teacher appraisal and about possible implications for teacher education. Below, we will discuss the lessons we learned throughout our construction process, which we believe will provide inspirations for further modification, implementation, and research in teacher education as well as in teacher appraisal for professional development.

Lesson Learned from the Construction Process

Competency Grounding, though challenging, is essential

In accordance with the global demands for preparing teachers with capacities for 21st century teaching and learning, our expert panels highly stressed that, in order to make the framework more effective, the constructed indicators must reflect an ideal 21st century teacher's knowledge, skills, and disposition. In the panel discussions with IB experts and from focus group interviews with experienced IB practitioners, we learned that 21st century competency-oriented teaching emphasizes holistic development of abilities and skills not only in the cognitive domain but also in the interpersonal and intrapersonal domains. Contemporary teachers are expected, in their teaching, to put more emphasis on inquiry-based learning, critical thinking, and interdisciplinary thematic learning experiences, on promoting collaborative learning, and also on cultivating student abilities for self-directed learning, problem-solving, and communication. According to the perspectives and expectations of experienced IB teachers and program coordinators, competent 21st century teachers must have sufficient professional knowledge and skills to support students in developing conceptual understanding, learning skills, and attitudes in context; they must hold high expectations for and build on the assets of diverse students to encourage global perspectives and to promote inter-cultural understanding and respect; finally, they must actively take part in professional learning communities, engage in reflective practices, share ideas with colleagues, and establish a sustainable support network for collaboration. In addition, almost all the IB coordinators and trainers pointed out that open-mindedness and flexibility are crucial dispositions that competent 21st century teachers must possess; as they face changes in school or in curriculum, they must be able to adapt, self-educate, and always try to be up to date.

Consensus Building, though not easy, is fundamental

In the process of designing and formulating performance indicator items, we learned that the selection of the wording is very crucial, especially the descriptive verbs and adjectives which tend to affect teachers' interpretation and understanding of the performance indicators. For example, in English, teacher "modeling" actually involves an "I do– You do– We do" three-step teaching strategy; however, when translated into the Chinese term "示範", some teachers interpreted it as "demonstration" only, while to other teachers, it might indicate "demonstrating with explanation." Such varied interpretations can lead to different performance expectations and can fail to convey the exact expectation of "modeling" in teaching. Also, many teachers pointed out that the way that the target performance indicators should be manifested in teaching (e.g., "supporting student's learning," etc.) may require more clarity in explanation. As for the possible misapplication of the performance indicators, we found that different stakeholders might have different expectations that often led to confusion in interpretation and judgment. To prevent confusion, we believe it is important, through group deliberation process among different stakeholders, to establish a consensus on the connotation and interpretation of performance standards and indicator items. In this way, a clearer, more applicable 21st century teaching performance indicator framework can be constructed; as one IB trainer suggested, "The more detailed and fine-tuned (the description of an indicator's dimensions), the better it provides clear guidelines to improve teachers' teaching."

Professional Growth Focused, though complex, is imperative

Moreover, to make the 21st century teaching performance indicator framework more effectual in actual application, it is vital to take teachers' concerns into serious consideration. Many teachers stressed that, when implementing the performance indicator framework, it must be contextualized and teacher-directed. Because a teacher does not work "in a vacuum" and because classroom dynamics play a very large role

in the way a teacher responds, plans, implements, and assesses, the framework should be used by teachers to focus on their own goals and objectives, associated with their own educational context/setting. In other words, as teacher expected, the framework should be used in a positive nonjudgmental, teacher-directed manner rather than in an external or top-down manner, and it should be introduced as a diagnostic tool for identifying strengths and limitations and for building professional growth plans by and for teachers. Indeed, since this study always intended to develop a performance indicator framework to help teachers enhance their perspectives and capacities for 21st century competency-oriented teaching and learning, the utilization of our framework should be non-evaluative and non-punitive, and it should focus on growth rather than on performance levels. Based on our discursive experience with participant teachers, we have ascertained that the process of discussing and establishing a consensus with teachers about the standards and indicators is in itself an effective and powerful way to facilitate teacher professional development. We highly recommend that the framework, derived from this study, be adopted as a school-based teacher appraisal medium for professional development and that it be used as a referential guide for teacher education in the preparing of competent 21st century teachers with the needed knowledge, skills, and dispositions. If the implementation of this performance indicator framework emphasizes merely the process of "assessing performance," it will surly miss out tremendously on a great opportunity to enhance teachers' capacities in teaching 21st century competencies and skills.

Conclusion

To prepare teachers for 21st century teaching and learning, there is a great need in many countries around the world to renew their existing teacher professional standards and performance indicators with updated standards that a competent, contemporary teacher should possess. Our study is just the beginning overture in Taiwan's research on developing teacher performance indicators for teaching 21st century competency-

oriented curriculum. In this paper we share our experience of constructive cooperation with many IB experts and practitioners and, of course, we offer the final derived framework of "Teacher Professional Standards and Performance Indicators for 21st Century Competencies." We hope our experience can help stimulate thinking for further research in developing, refining and/or implementing teacher performance indicators for quality teaching in the 21st century. Also, we hope the performance indicator framework we have developed can provide reference for the planning of appraisal and education programs for teacher professional development. We would like to encourage educational researchers, teacher trainers, and school administrators to use our performance indicator framework to assess, monitor, and improve teachers' performance and capacities in teaching. We believe the framework can be adopted in IB school systems, schools in Taiwan, and in other geographical locations, spurring the creation of useful international analogues and thus assisting in the understanding of teacher capacities required for 21st century teaching across the globe.

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Appendix

Teacher Professional Standards and Performance Indicators
for Twenty-first Century Competency-oriented Teaching and Learning
21世紀能力教師專業標準與表現指標

Standard 1

Drawing on students' prior knowledge and experience to prepare their readiness for new learning and asking thought-provoking questions to foster students' curiosity and to scaffold their thinking and inquiry.

運用學生的先備知識與經驗來預備學生開展新的學習，並提出能夠激發思考的問題以培養學生好奇心、協助學生的思考和探究。

Indicator 1	Indicator 2	Indicator 3
Eliciting student responses rela-tive to life experience and ex-amples connected to previous learning.	Asking different types of questions that stimulate curios-ity and engagement.	Demonstrating skills in asking high-order questions to scaffold, refine, and extend thinking and inquiry.
連結學生分享相關生活經驗以及與先前學習有關的範例。	提出不同類型的問題激發學生好奇心與專注度。	展現高層次提問技巧，協助學生精進並延展其思維和探究的能力。

Rationale:

When setting learning objectives of a lesson, teachers should always consider students' existing knowledge as well as experience and determine what students need to know, to understand, and to do. Teachers should identify students' learning gaps to scaffold their development in attaining the desired learning outcomes. In this regard, teachers not only ask hooking questions to stimulate students' curiosity and engagement but also ask guiding questions, beyond recalling facts, to facilitate student learning and inquiry.

在訂定學習目標時，教師必須要考量學生既有的知識與經驗，藉以決定什麼是學生需要知道、理解和做到的。教師應釐清學生的學習落差並輔助他們達到預期的學習成果。因此，教師不僅要提出吸引學生興趣的問題來引發好奇心和學習參與，也要超越事實記憶問題，提出指導性問題來促進學生的學習與探究。

Standard 2

Designing and implementing concept-driven learning activities to facilitate deeper understanding, and encouraging students to pose questions and to apply knowledge and skills in exploring local/global issues across disciplines.

設計並執行概念為本的學習活動以促進深度理解，鼓勵學生提問且應用所學，跨領域地探索在地或全球議題。

Indicator 1	Indicator 2	Indicator 3
Demonstrating appropriate approaches and presenting relevant materials/media in learning activities that foster conceptual understanding. 利用適切的方法以及相關媒材來促進概念的理解。	Modeling and making connections to real-life problems and issues in local/global contexts across disciplines. 示範並跨學科連結在地或全球脈絡中的議題與真實生活問題。	Involving students in self-evaluation of their understanding and construction of their questions and solutions. 創造機會讓學生評估自己的理解，並建構自己的問題和解決策略。

Rationale:

To foster conceptual understanding, teachers should employ different approaches and resources to engage students in authentic learning environments in which students have opportunities to develop cross-disciplinary understanding of real-life issues. In the process, teachers should involve students by having them self-evaluate their understanding, pose questions connected to local/global issues, and apply knowledge and skills in generating solutions.

培養概念性理解，教師必須採用不同的方式與資源來吸引學生投入真實學習情境，讓學生有機會發展對真實議題的跨學科理解。在過程中，教師應讓學生評估自己的理解、提出與在地或全球議題相關的問題，並應用知識與技能來產出解決方案。

Standard 3

Supporting students to use different languages/forms/media to express and exchange ideas and per-spectives effectively with different audiences for intended purposes

協助學生面對不同的對象與情境，能運用不同語言、形式與媒介，有效地表達、交流想法與觀點，來達到溝通目的。

Indicator 1	Indicator 2	Indicator 3
Allowing students to use dif-ferent languages and representa-tions to express and exchange ideas and points of view effec-tively.	Encouraging students to apply different forms and media to present their ideas and perspec-tives.	Providing opportunities for stu-dents to exercise multiple com-munication skills for different purposes with different audi-ences.
鼓勵學生使用不同的語言和表徵方式有效地表達、交流想法與觀點。	創造機會來引導學生運用不同的形式和媒介來展現其想法與觀點。	提供機會讓學生針對不同的目的與不同的對象，練習多種的溝通技巧。

Rationale:

To develop communication skills, teachers should provide opportunities to express and exchange ideas in different languages, forms, and media using multiple resources and different teaching strategies. Teachers should encourage students to present their ideas and perspectives through verbal exchanges (including use of the mother tongue and other languages), written media (books, newspapers, magazines, and website texts), visual representations (graphs, charts, and maps), or non-verbal expressions (body language, gestures, vocal pitch, and tone). Such opportunities help students to exercise multiple communication skills for different purposes with different audiences.

為發展溝通技能，教師必須運用多種資源和教學策略，提供機會讓學生可以使用不同的語言、形式和媒介來表達並交流想法。教師應鼓勵學生透過多元表達方式展現自己的想法與觀點，諸如口語交流（包含使用母語及其他語言）、書面媒介（書本、報紙、雜誌及網頁文本）、視覺表徵（圖、表或地圖）或非口語（肢體語言、手勢、音調、語氣）等。這些機會將有助於學生練習多元的溝通技巧，能夠因應不同的對象達到不同的溝通目的。

Standard 4

Preparing students with critical-literacy skills to search for, interpret, and evaluate information from multiple resources ethically for generating novel ideas and solving complex problems independently and collaboratively.

培養學生具備批判識讀能力，能在符合倫理規範下，搜尋、詮釋和評估多元資訊，據以獨立或協作提出創新的觀點並解決複雜的問題。

Indicator 1	Indicator 2	Indicator 3
Discussing the importance of academic honesty and providing guidelines for searching for, selecting, and evaluating information from different sources.	Guiding students to apply ethical principles in using, analyzing, and interpreting information.	Facilitating critical thinking in applying information selected, in generating novel ideas, and in solving problems independently and collaboratively.
幫助學生了解學術誠信的重要性，並提供資料搜尋、選擇和評估的準則。	引導學生在使用、詮釋和評估資訊時能遵守倫理規範。	幫助學生在獨立或協同應用資訊、提出創見和解決問題時發展批判思考能力。

Rationale:

To foster media literacy and critical use of information, students should recognize the importance of academic honesty and be provided with clear guidelines for interacting with media and utilizing information. In developing these skills, teachers should guide students to apply ethical principles in processing information and to establish a learning atmosphere that values integrity and promotes collaboration to generate novel ideas and to solve problems.

為養成資訊與媒體的批判識讀素養，必須幫助學生正視學術誠信的重要性，並提供媒體互動與資訊使用上的清楚準則。為達此目的，教師必須指導學生在處理資訊時能遵守倫理原則，避免直接介入學生學習成果的產出，並建立重視誠信、激發協作的學習氛圍，以產出創新想法來解決問題。

Standard 5

Taking into account the diversity of students' social, cultural, and language backgrounds in teaching and learning to foster students' identities as well as their intercultural understanding and respect.

教學時會考量學生在社會、文化和語言背景上的差異,並培養學生的自我認同及跨文化的理解與尊重。

Indicator 1	Indicator 2	Indicator 3
Demonstrating positive attitudes toward students' diverse social, cultural, and language backgrounds to support their identity development.	Providing opportunities that encourage students to share their family traditions, values, and cultural experiences.	Creating activities that nurture appreciation and respect for their own and others' socio-cultural traditions and values.
對學生不同的社會、文化和語言背景展現出正向態度,支持他們在身份認同上的發展。	提供機會鼓勵學生分享家庭傳統／價值和文化經驗。	創造能夠培養學生欣賞與尊重自我和他人的社會文化傳統和價值的學習活動。

Rationale:

Facing the challenges of globalization and migration, teachers should address the importance of international-mindedness and demonstrate positive attitudes towards the diversity in the life of others and in the world around us. Teachers should take into consideration the differences of students' social, cultural, and language backgrounds in teaching and learning to help foster students' identities. Teachers should design learning tasks to promote intercultural awareness and to develop understanding, appreciation, and respect towards different socio-cultural traditions and values.

面對全球化和跨國移動的挑戰,教師必須要強調國際情懷的重要性,並展現對他人生命中以及週遭世界中多元差異的正向態度。為培育學生的自我認同,教師必須將學生在社會、文化及語言背景上的差異納入教學考量。教師宜設計有助於促進跨文化意識的學習任務,來發展對不同社會／文化傳統與價值的理解、欣賞與尊重。

Standard 6

Understanding and being responsive to different interests, strengths, and special needs of students as well as supporting them to develop, pursue, and achieve their personal learning goals.

理解並回應學生的不同興趣、優勢和特殊需求，並支持學生發展、追求和達成其個人的學習目標。

Indicator 1	Indicator 2	Indicator 3
Using multiple existing assess-ment tools and evidence to iden-tify students' interests, strengths, and special needs in and for learning.	Implementing differentiated and responsive instructions to meet students' diverse learning needs.	Providing guidelines and sup-port that help students to set and achieve their personal learning goals.
運用多元評量工具與證據來了解學生學習上的優勢、興趣和個別需求。	運用差異化與回應式教學來滿足學生的多元學習需求。	提供準則與支持來協助學生設定並達成其個人的學習目標。

Rationale:

To maximize personal growth for all, teachers need to recognize and identify students' varied characteristics, cognitive readiness, learning styles, strengths, interests, and special needs. Teachers should tailor their instructional design and implementation through differentiated content, process, product, and environment to meet students' learning needs. Teachers should help students clarify their interests, strengths, and potentials to set realistic and challenging learning objectives and guide them to plan strategies and take actions to achieve their personal and academic goals.

為促使所有學生的個人成長達到極致，教師需要正視並識別學生的不同特質、認知預備度、學習風格、優勢、興趣與特殊需求。教師必須調整其教學設計與實施，透過差異化的教學內容、過程、成品和環境來滿足學生的學習需求。教師應協助學生釐清自己的興趣、優勢與潛能，藉以設定切合實際又具挑戰性的學習目標，並指導學生規劃策略、採取行動來達成其個人的與學業上的目標。

Standard 7

Designing and implementing various assessment tasks and criteria, aligned with stated learning ob-jectives and intended outcomes, to ensure students' continuous learning and growth.

設計並實施多種符合既定學習目標與預期成果的評量任務與規準，以確保學生持續地學習與成長。

Indicator 1	Indicator 2	Indicator 3
Designing and utilizing differ-ent assessments and criteria aligned with learning objectives and expected outcomes.	Implementing assessment tasks to scaffold students' learning performance and to help stu-dents learn how to learn.	Providing opportunities for stu-dents to self-assess, monitor, and adjust their own perfor-mances for improvement.
設計並運用與學習目標及預期成果一致的多元評量方式與規準。	實施評量任務以輔助學生的學習表現並幫助學生學習「如何學」。	提供機會讓學生自我評量、掌握和調整自我的表現，以求進步。

Rationale:

To ensure assessments-informed teaching and learning, teachers should conduct criterion-related assessments based on instructional objectives and desired learning outcomes. In doing so, teachers should apply assessment results to inform and enhance teaching. Students should be provided with feedback and opportunities for self-evaluation to improve their performances. Teachers can leverage formal and informal assessments in a number of ways to scaffold students' learning progression and to guide them to learn how to learn.

為確保以評量為參考的教與學，教師必須實施以教學目標和預期學習成果為本的效標關聯評量；要達成此目的，教師必須使用評量結果作為參考來提升教學，並且應提供學生回饋以及自評機會使能改進其學習表現。教師可以靈活運用正式和非正式評量，以多元的方式來輔助學生的學習進展並引導學生學習「如何學」。

Standard 8

Providing opportunities and feedback to help students identify and reflect on their strengths and weaknesses and become responsible for planning, managing, and assessing their own learning.

提供機會與回饋幫助學生釐清及反思自己的優勢與弱點，並能為規劃、管理與評量自己的學習負責。

Indicator 1	Indicator 2	Indicator 3
Providing evidence-based feedback on students' learning performances.	Involving students in self-assessment that helps them to reflect critically on their learning and to identify their strengths and weaknesses.	Providing concrete suggestions that guide students to become more responsible for planning and managing their own learning.
對學生的學習表現提供證據為本的回饋。	引導學生自我評量，幫助學生批判反思自己的學習，並了解自己的優勢與弱點。	提供具體建議引導學生對規劃和管理自己的學習負起責任。

Rationale:

To prepare students to become self-directed learners, teachers should take on a supportive and advisory role in guiding students to take charge of their own learning progress through taking the initiative in formulating goals, choosing appropriate approaches, and identifying needed materials and resources. Also, teachers should provide evidence-based feedback and opportunities for students to self-assess their performances, reflect upon their strengths and weaknesses, be resilient to setbacks and challenges, and become responsible for managing their own learning.

為培育學生成為自主學習者，教師必須扮演支持與諮詢的角色，指導學生藉由主動建立目標、選擇適合方式、確認所需資源等，來掌握自己的學習進展。此外，教師也須提供證據為本的回饋與機會，讓學生自我評估學習表現、反思自己的優勢與弱點、不屈不撓的面對挫折與挑戰，並且為管理自己的學習負責。

Standard 9

Establishing a safe, supportive, and collaborative learning environment and climate by providing guidelines/routines, resources, and consultation to engage students in effective learning.

透過提供準則、常規、資源和諮詢，建立安全且具支持性的合作學習環境與氛圍，促使學生專注於有效學習。

Indicator 1	Indicator 2	Indicator 3
Working with students to co-construct classroom learning guidelines/routines.	Creating and maintaining a safe and friendly environment/climate that supports classroom discussions and col-laboration.	Providing sufficient resources and consultation to promote student agency and productive learning.
與學生共同訂定課堂學習準則和常規。	建立並維持安全、友善的學習環境與氛圍，以支持課堂討論與協作。	提供充足的資源和諮詢，以提升學生的學習效能，並發展學生的學習主體性。

Rationale:

To provide essential support and resources for student-centered learning, teachers should set up clear guidelines and routines with students, provide needed advice and guidance for students, and maintain a safe and productive learning environment together. Teachers should create a positive and secure classroom climate that encourages discussions and collaboration as well as a sense of community wherein student voice, choice, and ownership of learning are valued.

為提供必要的支持和資源來促成以學生為中心的學習，教師必須與學生共同訂定清楚的準則與常規，提供學生所需的忠告和指引，並一起共同維持安全高效能的學習環境。教師必須創造積極正向而且安全信賴的課室氛圍，以鼓勵討論和協作，並建立一個重視學生意見、選擇與學習主權的社群意識。

Standard 10
Working collaboratively, engaging in professional development continuously, and demonstrating pedagogical leadership in action with open-mindedness and flexibility. 與教師同儕合作，持續投入教師專業發展，以彈性、開放的態度在行動中展現教學領導力。

Indicator 1	Indicator 2	Indicator 3
Working collaboratively with students, colleagues, and parents for students' learning development.	Engaging in various professional development that promotes continual personal and profes-sional growth.	Being open-minded and flexible toward change and being willing to take active roles in innovative pedagogical practices.
能夠與學生、教師同儕和家長共同合作以協助學生學習發展。	投入各類的教師專業發展活動，持續地促進個人與專業的成長。	對於變革保持開放的態度，並積極領導課程創新與實踐。

Rationale:

Teaching is a learning profession in which teachers need to be engaged in the constant professional development necessary to update their knowledge and skills and to acquire new insights from educational research which will allow them to employ innovative and effective curricular and pedagogical practices. Teachers should be open-minded and flexible in working with others and in exploring new ideas, be resilient in confronting challenges and changes, and be able to take active leadership roles in teaching and learning.

教學是一種持續學習的專業，教師必須投入必要的持續性專業發展，以更新知識和技能並從教育研究中獲得新見解，使他們能運用創新有效的課程與教學實踐。教師在與他人共事及探索新想法時胸襟應開明靈活，在面對挑戰和變革時應不屈不撓，而且能夠在教學與學習上扮演積極主動的領導角色。