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From "Dual Learning Scenarios" to "Influencer Teaching Method" - Interpretation of The Open University's "Innovating Teaching and Learning Report" (2022 Edition)

Qing Li[1]*, Hui Gao[2]
[1]School of Network Education, Beijing University of Posts and Telecommunications, Beijing 100876, China
[2]School of Marxism, Beijing University of Posts and Telecommunications, Beijing 100876, China

***Corresponding author:** Qing Li, liqing_l@163.com

Abstract:

The "Innovating Teaching and Learning Report" is a series of academic reports led and published by The Open University in the UK. The 2022 edition of the report presents ten innovative teaching and learning methods, analyzed with practical cases: "Hybrid Model" enhances flexibility and opportunities for learning through a combination of online and offline approaches. "Dual Scene Learning" bridges theoretical learning in the classroom with practical learning in the workplace. "Micro-credential Teaching Method" builds a curriculum system based on micro-courses that are conducive to developing work or vocational skills. "Self-directed Learning" aims to help learners cultivate the ability to learn freely and independently. "Watch Party" reflects the trend of watching videos and learning together with enthusiasts. "Internet Celebrity Teaching" elevates learning from influencers on social media platforms to a teaching model. "Home Education" discusses the importance and ways of the home as a learning place. "Discomfort Education" promotes learning and achieves social justice by transforming negative emotions. "Health Education" focuses on health elements in teaching, and "Walk and Talk" combines movement and dialogue to improve learning effectiveness. Additionally, the report summarizes research findings from the past decade, categorizing nearly 100 published teaching and learning methods into ten themes such as "Connecting with Others," "Emotion," and "Education Equity." The value of the ten innovative teaching and learning methods proposed in the 2022 edition lies in further clarifying the characteristics of the era led by digital transformation in educational development, showing more lasting and profound attention to education equity, focusing on individuals' emotional needs and self-development in pursuit of higher-quality education, and presenting new requirements for teachers' basic literacy and professional abilities.

Keywords:

Innovative teaching and learning methods
Information-based teaching
Open education
Post-COVID era
Education equity

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1. Background

The "Innovating Pedagogy Report" (IPR) is a series of reports led by the Institute of Educational Technology (IET) at The Open University, UK, introducing trends in educational innovation to the education community. Initiated in 2012, the report is published annually and has released 10 editions thus far. Each edition presents and introduces 10 teaching methods with potential impact on educational development or innovation, targeting a wide readership including researchers, teachers, and policymakers.

In July 2022, the 10th edition of the IPR (hereinafter referred to as IPR10) was released, introducing ten teaching methods such as the "Hybrid Model," "Dual Scene Learning," and "Micro-credential Teaching," among others, with detailed explanations for each [1]. These methods range from increasingly popular practices like "Hybrid Model" and "Micro-credential Teaching" to those newly applied in educational practice but normalized in other fields, such as "Internet Celebrity Teaching" and "Walk and Talk." Additionally, methods like "Home Education" and "Discomfort Education" are emphasized to adapt to the educational development in the post-COVID era.

To expand its global perspective and international influence, IPR has invited a research institution from outside the UK to participate in report compilation annually since 2015. Research institutions from six countries, including the US, Norway, and China, have become collaborators. On the 10th anniversary of the report, IPR10 invited the Universität Oberta de Catalunya (UOC), also part of The Open University system, to co-author the report. Dr. Kukulska-Hulme, the editor-in-chief of IPR10, has presided over three editions of IPR. Among the 16 contributors, 7 have participated in more than half of the report compilations and are all researchers from the IET at The Open University. Dr. Rebecca Ferguson served as the editor-in-chief for both IPR6 and IPR7. The relatively stable team of writers ensures the unity of the report's style and academic quality. As in previous years, the four experts from the collaborating UOC were all first-time participants, providing several teaching methods and multiple case studies from UOC.

2. Methodology and core concepts

In this series of reports, "Pedagogy" refers to concepts, methods, technologies, and practices that facilitate teaching and learning. Over the past decade, most of the teaching methods collected and introduced in the reports have been closely related to educational informatization or online learning, often implemented or supported by ICT technologies. The compilation process remains largely the same as in previous years: Firstly, opinions from various members of the writing team are widely solicited, and the nominated teaching methods are organized into a candidate list representing the latest teaching innovations. Then, they are ranked based on their importance, influence, and development potential, and the top 10 most likely to spark innovation in educational practice are selected. Finally, through discussion and revision, the annual 10 innovative teaching methods are proposed. The structure for each teaching method is also consistent, including seven parts: title (with a short explanatory sentence), introduction, main content, case studies, conclusion, references, and additional resources. The ten innovative teaching methods proposed in IPR10 are detailed in **Table 1**.

Table 1. Ten innovative teaching methods in IPR10 (2022 Edition)

Serial number	Teaching method
P1	Hybrid models
P2	Dual learning scenarios
P3	Pedagogies of micro-credentials
P4	Pedagogy of autonomy
P5	Watch parties
P6	Influencer-led education
P7	Pedagogies of the home
P8	Pedagogy of discomfort
P9	Wellbeing education
P10	Walk-and-talk

The study finds that the focus on online education and open education pedagogy has become a prominent feature of IPR10. The 2022 edition of the report states in its introduction: "The Open University has always

led the development of online education. Students may wish or need to engage in education through a hybrid of on-site and remote learning." Among the 10 teaching methods proposed, half are related to this, including the "Hybrid Model," "Dual Scene Learning," "Micro-credential Teaching," "Self-directed Learning," and "Internet Celebrity Teaching." This reflects the contextual background of the report's release in the post-COVID era, to adapt to rapid social changes and uncertainties, countries are attempting to diversify and equalize educational provision through online means, accelerating the transformation and innovation of digital education.

3. Innovative teaching methods in IPR10

3.1. Hybrid model

Since the COVID-19 pandemic, the exploration and focus on hybrid education models have grown exponentially. This model, based on information technology, adopts a more flexible approach that integrates the characteristics of face-to-face teaching and online learning, enhancing learners' educational experiences. On the one hand, commercial video conferencing platforms like Zoom and Teams (and in China, Tencent Meeting and DingTalk) have greatly facilitated the widespread use of remote real-time teaching, allowing students to access classroom learning remotely at a lower cost. On the other hand, the rapid development and popularization of large-scale online education, primarily in the form of MOOCs, have increased educational opportunities through open hybrid teaching, contributing to educational equity and personal development.

In higher education and continuing education, the hybrid teaching model has gradually become widespread, providing students with more flexible learning services. Students can choose and switch between face-to-face and synchronous/asynchronous online learning independently. Synchronous online learning often takes place through video conferencing or real-time interactive discussions, occurring simultaneously with face-to-face classroom teaching. Asynchronous online learning allows learners to control their time and learning progress, by studying through online forums or chat tools. Typical examples include the Hyflex model at San Francisco State University, Rebelflex at the University of Nevada, and the Blendflex model at Central Georgia Technical College.

The design of hybrid teaching should focus on the following points [2]: (1) Providing learners with multiple topics that cater to individual learning paces or preferences; (2) Ensuring similar learning outcomes for different types of learners; (3) Offering supplementary teaching materials that meet diverse needs; (4) Focusing on learners' performance throughout the teaching process. IPR10 suggests strategies for hybrid teaching: active learning strategies, collaborative learning and teamwork to enhance student interaction and knowledge co-construction, using the "flipped classroom" to integrate various learning activities, enriching teaching with short videos, gamification, and interactive content, providing formative feedback, encouraging self and peer evaluation, project/inquiry-based learning, and integrating and adapting learning materials.

3.2. Dual scene learning

Dual scene learning is a teaching model that bridges industry needs and classroom instruction, connecting the classroom and the workplace. In this model, classroom learning is closely linked to professional practice, applying theoretical knowledge learned in the classroom to work scenarios and feeding back business needs from work into the classroom. In recent years, with the development of network technology, industrial digital transformation, and the impact of COVID-19, more people have opted for a "work-from-home" model, and learning has been integrated into this scene. In this context, dual-scene learning focuses on integrating techniques and methods required for both scenes, aiming to achieve effective teaching through careful instructional design. It helps students develop insights and professional literacy to tackle the challenges of the era, offering advantages such as adapting to student employment, keeping pace with technological innovations, and suitability for corporate innovation and development.

In traditional settings, classroom teaching is organized by subject and focuses on individual learning. However, in industrial production practices, problem-solving requires the integrated application of skilled techniques. Dual-scene learning pays attention to production practice needs and promptly incorporates required content into classroom teaching, promoting

the integration of industry and education. For instance, UOC's vocational training department has begun shifting its teaching model and adjusting course offerings, moving from a "competency-based learning" approach to a "know-how" and "project-or-problem-based learning" model [3]. This teaching method organizes course projects in groups or individually, adopting collaborative group learning that directly aligns with enterprise needs and develops practical courses based on real-world industrial projects. The learning process is tracked by schools and enterprises, employing a 360-degree comprehensive evaluation covering processes, skills, and knowledge (**Figure 1**). This process demands exploring the most suitable methods, teaching techniques, and tools, implementing interdisciplinary teaching approaches, and posing higher requirements for teachers' capabilities.

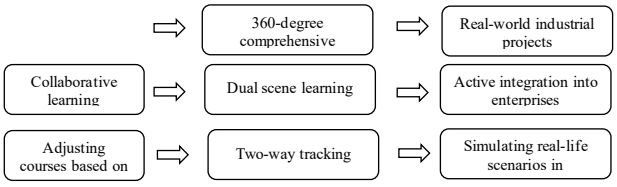

Figure 1. Key elements supporting dual scene learning (Translated from IPR10 Illustration).

In terms of constructing a dual-scenario learning space, some educational institutions conduct teaching through digital simulations of real-world industrial scenarios or provide remote simulated practical environments. For instance, the Open University in the UK utilizes the OpenSTEM laboratory for engineering skills training, allowing students to experience laboratory equipment in a real-world context and conduct relevant experiments [4]. The Norwegian vocational education and training system effectively integrates the existing "blended learning" among learners, training departments, schools, and enterprises [5]. Dual-scenario learning also brings innovation to evaluation reform. It attempts to integrate feedback from both the education and industry sectors for systematic evaluation. Additionally, it uses information technology to track students and record behavioral data, helping teachers fully understand students' learning behaviors and enabling complex learning process analysis.

3.3. Micro-credential teaching

Micro-credentials, a new type of qualification certificate that has gradually become popular in the past decade, are recognizable and branded professional skill certificates (including digital badges, certificates, academic/professional skill certificates, etc.) obtained by learners through staged learning and awarded by the course organizer. Primarily targeted at vocational and professional skill training, these credentials are generally earned through online learning, providing learners with more learning opportunities. Compared to traditional certificates, they store more information online, making them easier to save and access.

Micro-credential teaching mainly focuses on professional skill training for employment, helping students transition from being students to professionals. Recently, there has been a growing call to integrate micro-credential teaching into existing educational systems. For example, the European Commission has aligned micro-credentials with the European Credit Transfer and Accumulation System (ECTS) [6]. Micro-credentials worth 1–5 credits can be part of formal educational courses, while those representing skills from short-term learning programs worth 5–30 credits can be included in professional qualification frameworks. The National Education Association in the US offers nearly 200 micro-credentials related to the professional development of educators, targeting specific subjects [7]. The EPICA project in East Africa integrates micro-credentials into the university curriculum as complementary academic recognition for graduates [8]. Some industries or international qualification-based "professional skills" have also established conversion channels between certification and micro-credentials.

Because micro-credentials primarily target those who are about to enter or are already in the workforce, there are significant differences in subject matter, duration, level of difficulty, and skill development goals. They also come in various formats, and there is no one-size-fits-all teaching method. Therefore, micro-credential teaching and design should fully consider factors such as the target learner group's professional skills, previous work experience, online learning skills, self-management abilities, sense of belonging, and student-teacher ratio. However, based on recent practices, teaching modes such

as e-portfolios, competency-based learning, case-based learning, and conversational learning are commonly used in micro-credential programs.

3.4. Self-directed learning

With the widespread adoption of online learning and the impact of the COVID-19 pandemic, research and practice in self-directed learning have been increasing. This teaching method integrates learning and teaching activities, helping to enhance learners' autonomy and self-direction. Self-directed learning emphasizes developing students' self-regulatory abilities, including managing emotional responses to setbacks or successes, maintaining focus, and interacting with others. Common self-directed learning strategies include metacognition/self-reflection (reflecting on thought processes), time management (creating a learning schedule), sustained effort, peer learning, connective learning (connecting new material with existing experiences), elaboration (repeating until thorough understanding and mastery), relating and organizing, and critical reflection.

The stronger a learner's awareness of self-directed learning, the higher their learning ability and autonomy. Therefore, raising learners' awareness of self-directed learning and enhancing their abilities in this area are crucial for personal career development [9]. To this end, IPR10 suggests five directions to enhance self-directed learning abilities: improving learner engagement and experience, encouraging learners to explore valuable individual paths, providing personalized design of subjects and tasks, enhancing learners' ability to reflect on their learning and actions, and teacher support during the self-directed learning process.

Currently, self-directed learning still faces many challenges. Although many software programs or platforms provide planning and management functions to help learners with self-management, there is still a lack of targeted strategies and tools to improve student autonomy. Most existing teaching methods focus on specific subject areas and inadequately cultivate "soft skills" such as time management, communication, critical thinking, and problem-solving abilities. Additionally, some students may experience frustration and loneliness when learning independently without teacher guidance.

3.5. Watch party

Party refers to the learning behavior where learners located in different places watch media (videos) online simultaneously. Since Facebook opened its "Watch Party" feature for real-time group video watching in 2018, platforms like Netflix, Disney+, Amazon, Twitch, as well as domestic platforms such as Bilibili and Douyin, have all provided similar functions and services. Some platforms also offer activities like previewing and group reflection discussions around related topics.

With the significant increase in demand for online learning, Watch Party learning has gradually become a part of formal courses. Kuepper-Tetzel *et al.* (2021) have proposed the concept of "observation lectures," where a 45-minute lecture is recorded into 2–3 short videos and uploaded to a learning platform for students to watch collectively [10]. This model provides students with systematic learning content, allows synchronous interaction, and fosters a sense of presence between teachers and students [11].

During video production for Watch Parties, techniques such as emphasizing key information, recording in modules, introducing dialogue, and providing viewing guides can maximize student engagement and a sense of belonging. This teaching method breaks the limitations of physical space, allowing learners to participate in the learning process with a free and relaxed mindset. However, in teaching practice, it's essential to consider the impact of networks and viewing devices on teaching effectiveness and learning experience and accommodate the needs of special groups (such as those with visual or hearing impairments) by adding subtitles, sign language translation, and other accessibility features to the videos.

3.6. Influencer teaching

In recent years, a large number of "influencers" have emerged on new online media platforms. They share their views on products, services, and social trends or hot topics through multi-sensory media formats like images, animations, infographics, and videos. This trend has also affected the field of education, where some "influencers" with teaching abilities have become teachers, or some qualified teachers have become "influencers," providing educational content and services, known as "Influencer

Teaching."

The content of Influencer Teaching is very broad, including both formal education-related courses such as university courses and training programs, as well as informal learning content like politics, economics, social topics, fitness tips, and handicraft skills that are popular among the general public. It typically takes the form of live online lectures, and short videos, and attempts to form personalized connections with followers. Influencer teachers and followers can interact through likes, comments, or live chat, forming social groups and enhancing a sense of belonging. As a result, educational institutions have begun to explore using Influencer Teaching to expand their influence. For example, the Open University in the UK publishes one-minute "mini-lectures" on different educational topics on YouTube to guide and help learners better engage with complex scientific content [12].

Today, "online socializing + learning" has become a global trend. Influencer Teaching, with its wide audience reach, strong appeal, flexible learning methods, and prominent learning themes, will continue to have a significant impact and play an increasingly important role. However, we should also recognize that Influencer Teaching can be easily over-commercialized, lack effective regulation, and deviate from the essence of education. Additionally, issues such as user privacy protection, uncontrollable content push, and online harassment of influencer teachers need to be addressed and resolved.

3.7. Home education

Since the pandemic, learning from home has become the norm. Home education, including community education and learning in institutions like museums, has naturally become a crucial component of informal teaching and learning practices. For instance, Mexican-American home education significantly impacts children's understanding of schools, teachers, higher education, and employment [13]. Similarly, the home education received by children in Puerto Rican families aids them in completing higher education [14]. Related studies also show that parents' understanding of careers can influence their children's choices in applying for university and selecting majors, as well as employment decisions after graduation [15]. Parents' assistance in choosing relevant books greatly affects their children's reading strategies [16]. Additionally, home education can help teachers and students understand and address common learning situations and issues such as bullying in various contexts and cultural backgrounds.

Currently, there is a growing understanding of new forms of home education, and the implementation of related policies is gradually strengthening. IPR10 highlights that home education can assist marginalized groups in achieving better learning experiences and academic accomplishments. It also serves as a reminder for teachers to consider situations beyond the school environment and design targeted teaching strategies. However, in practice, special attention should be paid to ensuring that home education is culturally appropriate, considering factors like cultural traditions, experiences, ethnic diversity, and integration with school education to enhance the relevance and effectiveness of learning [17].

3.8. Discomfort education

Discomfort education is a self-reflective way of thinking and process, introduced by Boler (1999) in the late 1990s [18]. This teaching method requires students to think critically about issues, which may generate a range of emotions, including discomfort. In discomfort education, emotions serve as powerful tools to question and break preconceived notions. Through activities like collective debate and reflection, students and teachers can gain new understandings and take novel actions. By overcoming uncomfortable emotional experiences, teachers and students develop a deeper understanding of their own and others' emotions, fostering better ways of relating to each other.

IPR10 outlines four key elements for designing discomfort education: (1) considering the application of observation and reflection; (2) understanding and acknowledging discomforting emotions; (3) avoiding the trap of binary guilt and innocence; (4) learning to accommodate the self. Casinader (2021) emphasizes that teachers should possess the necessary professional knowledge to conduct sensitive topic teaching in a controlled environment when adopting this model [19]. Establishing trust between teachers and students and focusing on student feedback is crucial for prepared

teaching. However, there are challenges in implementing discomfort education practices, such as potential ethical concerns for teachers when causing discomforting emotions in students and not all students being receptive to this type of learning.

3.9. Health education

In the context of the COVID-19 pandemic, there has been an increasing focus on the relationship between education and health. The World Health Organization defines good mental health as a state of well-being where individuals realize their abilities, can cope with normal life stresses, work productively, and contribute to their community [20]. Students who feel happy and satisfied with themselves are likely to achieve better academic outcomes. Therefore, health education aims to promote the formation of healthy mental health lifestyles among learners, consider the impact of mental health in curriculum design, help students understand themselves, and learn to seek help when facing psychological obstacles to enhance their mental health literacy.

Health education has made significant progress in recent years. In 2020, the UK released "The Step Change Framework" [21], advocating for universities to prioritize mental health education. This framework encourages the consideration of students' physical and mental health in curriculum design and the implementation of appropriate measures to promote the mental health of teachers and students. UNESCO has initiated a five-phase health education program that includes tasks such as establishing implementation teams, defining work objectives, focusing on priority groups and stakeholders, selecting implementation strategies, creating implementation plans, executing plans, and monitoring adjustments [22]. The key aspect of health education is the active participation of students and staff in the entire school/university policy-making process, establishing a shared vision, and working towards it. Schools should minimize and eliminate prejudices, helping students cope with difficulties and challenges, learn to express freely and seek help when needed.

3.10. Walking and talking

On the one hand, online learning often leads to prolonged sitting, which can have adverse effects on health. On the other hand, long-term solitary learning can easily give rise to social issues. To address these concerns, walking meetings have become a trend during the pandemic, offering a healthier way to work.

In educational research, walking interviews conducted by researchers and interviewees have also emerged [23]. When applied to teaching, walking and talking is a pedagogical method that combines movement and dialogue to enhance learning effectiveness. A study in Liverpool, England, has shown that walking and talking can help new immigrants improve their language skills, facilitate their understanding of the local area, and integrate into the local community more quickly. Through this approach, new immigrants gain psychological support, expand their personal resource networks, and benefit from improved physical and mental health.

From a learning perspective, students walking and talking under the guidance of a teacher can experience and navigate challenging tasks. This process can help reduce anxiety in learning, bring new perspectives to thinking, and foster creative thinking. Walking and talking promote learning through dialogue and have shown considerable potential in both formal education and informal learning environments. However, it should be conducted in a safe environment, taking into account factors such as the accessibility of walking spaces, geographical limitations, distractions, and the needs of special populations to mitigate any adverse impacts.

4. Content analysis of the 2022 annual report

4.1. Analysis framework and results

To maintain consistency, this study continues to use the content analysis framework developed in previous years for interpreting the IPR. This framework analyzes the report's content from four perspectives: basic information, the disciplinary and technological foundations of teaching methods, the contexts in which teaching methods are used, and the dimensions reflected in the teaching methods. Due to the removal of predictions regarding the period and potential impact of influences in IPR10, the corresponding two sub-categories have been eliminated, and applicable scenarios have been added accordingly. The classification results of the 10 innovative teaching

methods interpreted in IPR10 are detailed in **Table 2**.

Overall, the teaching methods described in IPR10 demonstrate strong practicality and can be directly applied to teaching practices. Methods like "Hybrid learning," "Micro-credential teaching," and "Self-directed learning" are already widely used; while "Home education," "Discomfort education," and "Health education" place more emphasis on educational philosophies and values, although report also provides some application cases. Regarding application scenarios, "Discomfort education" and "Health education" are more prevalent in school settings, while "Home education" and "Walking and

Table 2. Content analysis of ten innovative teaching methods in IPR10

First-level category	Second-level category	Classification	Teaching methods (number)
Basic information	Belonging level	Conceptual level, practical level	Conceptual level (3): P7, P8, P9; Operational level (7): 7 other items
	Applicable scenarios	Formal education, informal education, etc.	Formal education (2): P8, P9; Informal education (2): P7, P10; Not limited (6): 6 other items
Foundation of innovative teaching methods	Technical foundation	Digital content development/publishing, Internet technology, Smart technology, Entertainment and education technology, Mobile technology, Knowledge management/sharing, Data analysis/ mining technology, others (non-technical optional), Comprehensive (using multiple technologies)	Internet technology + Digital content (2): P5, P6; Others (5): P4, P7, P8, P9, P10; Comprehensive (3): P1, P2, P3
	Disciplinary foundation	Psychology and education, neuroscience, computer science, media technology, sociology, and others	All involve education, and additionally: Media/Communication Technology (2): P5, P6; Sociology/Psychology (3): P7, P8, P10
Application scenarios of innovative teaching methods	Target groups faced	Primary and secondary school students, university students, professional groups, and other personnel	Professional groups (2): P2, P3; Juveniles (1): P7; Unlimited (7): 7 other items
	Applicable disciplines	Natural science, social science, interdisciplinary, etc.	Psychological/Social disciplines (2): P8, P9; Unlimited (8): Others
	Applicable teaching content	Cognitive domain, affective domain, psychomotor domain, metacognition, others (unlimited)	Not explicitly mentioned in IPR10, but each teaching method has its focus, as detailed in the introduction to each method in the previous text.
	Applicable target levels	Low, intermediate, advanced, and unlimited	
	Requirements for teaching environment	Online, offline, hybrid, and unlimited	Online (4): P5, P6; Offline (3): P7, P8, P10; Hybrid (2): P1, P2; Unlimited (3): P3, P4, P9
Dimensions embodied by innovative teaching methods	Main educational elements of focus	Educational objectives, learner analysis, teaching content, teaching methods and media, teaching management, teaching evaluation, and comprehensive	Educational objectives (3): P3, P8, P9; Learners and teaching methods (2): P4, P10; Teaching media (2): P5, P6; Comprehensive (3): P1, P2, P7
	Correspondence with the research objects of educational technology	Process (a series of operations or activities pointing to results, including learning process and teaching process); resources (including media, content, personnel, etc.); comprehensive	Process (5): P4, P7, P8, P9, P10; Resources (3): P5, P6; Comprehensive (including P3): P1, P2

talking" are geared towards out-of-school environments. The other six methods have no apparent bias and can be applied in both formal and informal educational settings.

Among these teaching methods, some rely heavily on information technology. Hence, the technological foundation serves as a crucial observation angle. "Watch party" and "Influencer teaching" primarily revolve around or depend on online videos and streaming media, with digital content and internet technology forming their technological foundations. The "Hybrid model," "Dual-scene learning," and "Micro-credential teaching" utilize a combination of various online and offline technologies, classifying them as comprehensive. The implementation of "Self-directed learning," "Home education," "Discomfort education," "Health education," and "Walking and talking" can be achieved without relying on information technology.

Regarding disciplinary foundations, certain teaching methods incorporate theories from fields beyond education. For instance, "Watch party" and "Influencer teaching" are typical examples of online communication phenomena, closely linked to media theory and communication studies. Implementing these methods requires teachers to understand the characteristics of online media and its evolution, along with grasping the psychology of online audiences and the principles of online communication. "Home education" involves verbal instruction and intergenerational learning within families, making it intertwined with sociology and ethics. "Discomfort education" and "Walking and talking" are related to social and cultural issues, with the former also challenging learners' emotions and necessitating sociological and psychological knowledge as theoretical support.

In terms of application contexts, "Dual-scene learning" and "Micro-credential teaching" are more suitable for young professionals proficient in information technology. "Home education" targets minors within families, while the other methods have no specific group limitations. As for subject applicability, "Discomfort education" leans towards social science content, and "Health education" focuses on mental health. The remaining eight methods have no disciplinary restrictions.

Concerning teaching environment requirements, "Watch party" and "Influencer teaching" clearly rely on digital media and internet platforms. "Home education" and "Walking and talking" are predominantly offline activities, and "Discomfort education" also tends to be more effective offline for deeper engagement. "Hybrid learning" and "Dual-scene learning" exhibit a distinct blend of online and offline elements, while the other three methods have no specific environmental requirements.

Among the ten teaching methods in the 2022 edition, some focus on specific educational goals. For example, "Micro-credential teaching" targets and aids professionals in cultivating and developing relevant skills in the workplace, "Discomfort education" emphasizes critical participation in social issue discussions, and "Health education" promotes learners' physical and mental health in the post-pandemic era. Others place more emphasis on learners and learning methods, such as "Self-directed learning," which aims to enhance learners' self-regulation abilities, and "Walking and talking," which organically combines exercise and learning. Technology-enhanced teaching media is also one of the focal elements, as evidenced by teaching methods like "Watch party" and "Influencer teaching," which are both based on online videos. The other three teaching methods belong to a comprehensive category, covering several of the aforementioned aspects. From the perspective of their correspondence with research objects, only "Watch party" and "Influencer teaching" have a more pronounced association with network resources. "Hybrid model," "Dual-scene learning," and "Micro-credential teaching" are clearly related to both processes and resources, while the other five teaching methods primarily focus on the teaching process.

4.2. Historical connection with previous reports

The "Innovative Teaching Report" has been published for 10 years. To this end, IPR10 reviews and summarizes the teaching methods of the previous 10 years, grouping all published teaching methods into ten themes, with each theme containing 7 to 13 teaching methods (**Table 3**). The study believes that these ten themes are more based on core topics for aggregation and induction, rather than conceptual frameworks constructed based on a specific theoretical guidance. For instance, the three themes of "Connecting with Others," "Enhancing Emotional Elements," and "Educational Equity" are difficult

Table 3. 10 themes divided by IPR teaching method

Name	Quantity (number)	Examples of typical teaching methods
Connecting with others	7	Rhizomatic Learning (IPR1), Telecollaborative Language Learning (IPR9), Viewing Parties (IPR10)
Enhancing emotions	7	Learning through Wonders (IPR7), Fun Reading Learning (IPR7), Gratitude Education (IPR9)
Educational justice	10	Decolonizing Learning (IPR7), Intergroup Empathy (IPR6), Discomfort Education (IPR10)
Resourcing learning	11	Big Data Inquiry (IPR6), Blockchain-Based Learning (IPR5), Learning with Chatbots (IPR9)
New settings for learning	12	Location-Based Learning (IPR2), Online Laboratories (IPR8), Hybrid Models (IPR10)
Frameworks to support thinking and learning	13	Design Thinking (IPR5), Productive Failure (IPR5), Health Education (IPR10)
Learning in an open world	7	Learning through Open Data (IPR8), Micro-credential Teaching (IPR10), Open Textbooks (IPR6)
Learning in daily life	10	Learning through Social Media (IPR5), Learning through Video Games (IPR5), Homeschooling (IPR10)
Making learning personal	8	Student-led Analytics (IPR6), Formative Assessment (IPR7), Autonomous Learning (IPR10)
Engaging learners	11	Learning through Narratives (IPR4), Learning from Animations (IPR8), Walk and Talk (IPR10)

to fit into a single framework. Even so, the thematic classification of the IPR reflects the editors' thinking to some extent, helping people choose a specific theme for in-depth research based on their needs or find suitable teaching methods to enhance teaching practice.

Using these ten themes as clues, the connection between IPR10 and the previous nine annual reports in terms of teaching methods becomes evident. Teaching methods grouped under the same theme have strong or weak correlations, but at least they can be used to address similar issues in teaching practice. For example, "Educational Equity" is a theme that has been continuously addressed in the series of reports, with a total of 10 teaching methods related to this theme. In IPR10, "Discomfort Education" focuses on discussing how students can form new understandings of events and promote behavioral changes through the discomfort they experience when critically engaging with relevant topics. The same theme is reflected in "Social Justice Education" (IPR8) and "Decolonizing Learning" (IPR7), both encouraging students to discuss and critique current social injustices.

The theme of "New Learning Scenarios" is also popular. Both "Hybrid Learning" and "Dual-Scene Learning" in IPR10 fall under this theme. "Hybrid Learning" emphasizes a combination of online and offline learning, which can be implemented through the "Flipped Classroom" (IPR3) approach or by moving experimental practices online through "Online Labs" (IPR8) to address limitations in offline experimental conditions. "Dual-Scene Learning" utilizes "Seamless Learning" (IPR6) techniques and is closely related to "Context-Based Learning" (IPR4) in terms of teaching methods.

It should be noted that connections between teaching methods can be viewed from multiple perspectives. Besides the aforementioned topic-based associations, they can also be based on similar technologies, such as "Location-Based Learning" (IPR2) and "Place-Based Learning" (IPR7). Another connecting thread is when different teaching methods target the same type of learners, such as "Influencer Teaching," "Learning Through Social Media" (IPR5), and "Learning Through

Video Games" (IPR5), all aimed at informal learning groups.

5. Analysis and outlook

5.1. Digital transformation will promote innovative development in education

Currently, industrial digitization has become a global trend, and digital transformation has also emerged as a national strategy in many countries. Digital technology is gradually being applied to the construction of various social sectors, and education's response to the digital era is timely. The IPR10 report repeatedly mentions the continuous impact of digital technology on education. Teaching methods such as "hybrid mode," "online celebrity teaching," "dual-scene learning," and "watch parties" are all direct practical applications of digital society in the field of education. In January 2022, the State Council released the "14th Five-Year Plan for the Development of the Digital Economy," emphasizing the promotion of online education's supporting service capabilities and the sustained and healthy development of "Internet + Education" [24]. Guided by national policies, the construction of digital transformation in education in China is accelerating.

The digital transformation of education is a crucial part of digital industrialization. It is an inevitable stage of development for educational informatization, encompassing various aspects such as educational thinking and philosophy, infrastructure, educational resources, information conversion, digital literacy, digital governance, and practical applications. The implementation and enhancement of a series of digital projects will inject sustained development momentum into educational development and become an important manifestation of education adapting to and facilitating the development of a digital society. With the joint efforts of the education system and various sectors of society, China has made breakthrough progress in digital transformation work in education, including infrastructure, digital resources, information platforms, and application exploration [25]. However, there are still considerable challenges in areas such as the integration of digital technology and education, digital transformation of talent cultivation, compatibility and governance of the digital environment, and improvement of digital literacy.

5.2. Comprehensive and continuous attention to educational equity

From the continuous analysis of the IPR series of reports, we have found that attention to educational equity is increasingly prominent. Teaching methods such as "hybrid mode," "micro-credential teaching," "online celebrity teaching," and "watch parties" have broken the traditional single-time, single-location teaching model. Supported by technology, these methods further promote knowledge dissemination and educational equity, enabling high-quality educational resources to be quickly, efficiently, and cost-effectively spread to a wider range. At the same time, they satisfy personalized educational needs to a certain extent and improve the universality and relevance of high-quality educational resources.

Education has always been a public benefit for all humanity, playing a vital role in easing social tensions, breaking class barriers, and achieving social equity goals. Education services are a crucial part of public services, and the inclusiveness and fairness of education are guided by national policies. The "hybrid mode" emphasizes flexibility in learning and greater opportunities for online learning, while "micro-credential teaching" provides more learning options for people in the workplace. "Online celebrity teaching" and "watch parties" utilize modern information technology to achieve the widespread promotion of high-quality educational resources. The continuous promotion of educational equity mainly focuses on minimizing differences between regions, populations, and urban and rural areas. It further utilizes intelligent new technologies to promote the digital supply and networked services of high-quality data resources, facilitating optimal resource utilization and shared reuse [26]. This aims to promote the construction of a learning society and a lifelong learning system, allowing everyone to enjoy equal educational opportunities.

5.3. Education should focus on people's emotional needs and self-development

In the face of the repeated outbreaks of the COVID-19 pandemic, social tensions and pressures have become persistent and uncertain. When external pressure increases, people often seek development and comfort

internally, which is also reflected in the field of education. "Discomfort Education" in IPR10 believes that emotions are powerful tools for learning and promoting social justice, specifically mentioning the enhancement of understanding of oneself and others through emotional experiences to form better interpersonal relationships. "Home Education" considers the home as a place of learning and proposes that education should be adapted to culture, taking into account factors such as cultural traditions, social experiences, and ethnic diversity. "Self-directed Learning" emphasizes the importance of cultivating students' abilities to regulate their emotions in the face of setbacks or joys, develop focus, and interact with others. The values represented by these teaching methods all shine with the warmth of humanity, reflecting education's pursuit and reflection on "cultivating richer, more qualitative, and more ideal people."

Listening to the calls or needs from the depths of people's hearts, focusing on the physical and mental health and well-being of teachers and students, and emphasizing self-education and growth are the most fundamental pursuits of education. Gu Mingyuan (2018) believes that from the perspective of life development, the essence of education can be summarized as improving the quality of life and enhancing the value of life [27]. Ye Lan (2017) also pointed out that the mission of education has always been rooted in educating people because education is always human education, oriented towards human life, and a social practice activity conducted to improve the quality of human life [28]. Therefore, focusing on learners' individualized needs, respecting people's emotional needs, and emphasizing comprehensive human development have always been enduring research topics in the field of education and will continue to be key directions for educators to explore in the future.

5.4. Teaching innovation poses new requirements for teachers' professional abilities

Over the past 20 years, teaching technology has undergone rapid updates and iterations. The Internet, big data, artificial intelligence, blockchain, and even the metaverse have begun to be applied in education, triggering innovations in teaching models. Since the COVID-19 pandemic, this transformation process has accelerated significantly. In just a few months, classrooms moved from physical spaces to online platforms, and online teaching became normalized. A group of excellent teachers passively became "online celebrity teachers" through their own efforts. Information literacy and data literacy have become important components of teachers' professional abilities, and the ability to teach using information technology has become one of the key points of global education reform.

The teaching methods in IPR10 not only point out the trends and directions of teaching innovation but also place high demands on teachers' professional abilities. In terms of technical literacy, the "hybrid mode" places high demands on teachers' network media literacy. "Watch parties" need to consider the impact of networks and viewing devices on teaching effectiveness and learning experience. "Online celebrity teaching" encourages teachers with strong media application skills to fully utilize network media to disseminate knowledge and wisdom. "Dual-scene learning" requires communication between industry and education to seek the most appropriate methods, teaching, and technical tools for cross-disciplinary teaching. "Discomfort education" requires teachers to actively mobilize students' emotions, stimulate their critical thinking, and possess basic skills in managing their emotions. "Health education" calls on schools and teachers to consider students' physical and mental health in curriculum and teaching development. All these require teachers to strive to keep up with the trends of the times, continuously improve their professional abilities and information literacy, and better adapt to the development requirements of educational and teaching innovation in the digital, networked, and intelligent era.

Disclosure statement

The authors declare no conflict of interest.

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