REVIEW

Practical Validation of the ICAP Theory in China: Holistic Module Learning in the Shandong 271 Education Group

Weijie Meng,[1] Fengping Zhao,[2] Longjun Zhou[3]

1 *Nanjing Yutong Experimental School, Nanjing 211100, Jiangsu, China*
2 *Shandong 271 Education Group, Weifang 261325, Shandong, China*
3 *Division of Education and Economy, China Center, International Education Communication Agency, The BASE, USA.*

***Abstract**: ICAP is one of the most impactful theories in the international community of cognitive and learning science. ICAP research focuses on active learning and student engagement with high applicability and guiding value. In the context of the reform of curricula and instruction in China, this article seeks to pinpoint the commonalities between the ICAP theory and the rationale underlying the holistic module learning model prevalent in schools at Shandong 217 Education Group to verify the practicality of applying the theory to Chinese education.*

Science Insights Education Frontiers 2023; 18(2):2945-2958.
Doi: 10.15354/sief.23.re293

How to Cite: Meng, W., Zhao F., & Zhou, L. (2023). Practical validation of the ICAP theory in China: Holistic module learning in the Shandong 271 education group. Science Insights Education Frontiers, 18(2):2945-2958.

***Keywords:** ICAP Framework, Holistic Module Learning, 271 Education Group, China*

***About the Author**: Weijie Meng, Nanjing Yutong Experimental School, Nanjing 211100, Jiangsu, China. E-mail: 13608955415@126.com*

Fengping Zhao, Shandong 271 Education Group, Weifang 261325, Shandong, China. E-mail: zhaofengping5138@163.com

Longjun Zhou, Division of Education and Economy, China Center, International Education Communication Agency, the BASE, USA. E-mail: 294437034@qq.com

***Correspondence to**: Longjun Zhou at International Education Communication Agency, the BASE of USA.*

***Conflict of Interests**: None*

THE transformation of the learning paradigm is the focus of as well as the fundamental challenge to the recent decade's curricular and instructional reform in China and has garnered wide attention from Chinese educators and administrators. At the 2017's inaugural meeting of the "Teacher Professional Development Research Center" of the Chinese Education Society, Gu (2017) stressed that the primary issue with Chinese education was to transition from the emphasis on teaching to the focus on learning, to recognize students' agency in the classroom, and to make learning a student-centered process. To do so, it is necessary to encourage "active learning" in students through autonomous, exploratory, and engaging activities.

September 28, 2023, the Yidan Prize, known as the highest education accolade on earth, announced that its Prize for Education Research 2023 was awarded to Professor Michelene T.H. Chi from Arizona State University. According to Andreas Schleicher, head of the Yidan Prize for Education Research judging panel and Director for Education and Skills at the Organization for Economic Co-operation and Development, Chi's research is not simply an empirical classification of observational or existing research but rather an endeavor grounded on a solid theoretical foundation that integrates the main research achievements in the field of cognitive science and bridges the discrepancies in the literature. Her most significant contribution to educational research is the development of ICAP theory, a scientific theory of how students learn. She has organized different approaches to "active learning" into a simple yet widely applicable framework and is passionate about ensuring that this theory changes educational practice across the board (Liang, 2023).

The ICAP Theory

Chi (2009) proposed a taxonomy that aims to differentiate *active, constructive, and interactive* learning activities on the basis of learners' overt behaviors and levels of engagement. A hypothesis was generated from this taxonomy that *interactive* activities are most likely to be better than *constructive* activities, which in turn might be better than *active* activities, which are better than being *passive*. Here, overt activities refer to externally observable activities such as note-taking, concept mapping, and self-explaining (Chi et al., 1989). Learning engagement refers to the underlying cognitive processes for the overt activities that mediate learning in different ways (Chi, 2009).

After years of exploration, Chi and Wylie (2014) officially advanced the theory as the "ICAP Framework." In April 2017, Sheng, Ding, and Teng (2017) from Zhejiang University's School of Education introduced the ICAP theory to the Chinese educational community and underscored the value of this framework and its practical significance for teaching in China. Sheng

and Ding (2018) argued that the ICAP theory provided concrete, applicable recommendations on student engagement with learning materials in learning settings and could serve as a guide in creating teaching designs for various disciplines.

ICAP Hypothesis

According to the ICAP framework, student engagement behaviors can be categorized and differentiated into four modes: interactive, constructive, active, and passive. The ICAP hypothesis predicts that as activities move from passive to active to constructive to interactive, students undergo different knowledge-change processes, and, as a result, learning will increase (Chi & Wylie, 2014).

Passive Mode of Engagement. In the ICAP framework, the passive mode of engagement is defined as "learners being oriented toward and receiving information from the instructional materials without overtly doing anything else related to learning" (Chi & Wylie, 2014, p. 221). Paying attention is the key element in this level of engagement. Examples of paying attention include reading a text silently, watching a video without doing anything else, or listening to a lecture without taking notes.

Active Mode of Engagement. Learners' engagement with instructional materials can be labelled as active if some form of overt motoric behavior or physical manipulation is conducted. Overtly active behaviors include repeating or rehearsing, copying solution steps, taking verbatim notes, underlining or highlighting, summarizing by copy-and-delete, and so forth (Chi et al., 1994). Such behaviors cause focused attention while manipulating, which distinguishes them from overt activities that are carried out mindlessly (Chi & Wylie, 2014).

Constructive Mode of Engagement. Under the ICAP taxonomy, constructive behaviors are those with which learners generate or produce additional products beyond what is provided in the learning materials (Chi & Wylie, 2014). Examples of being constructive include drawing concept maps, asking questions, self-explaining, integrating across texts, taking notes in one's own words, and more. Constructive engagement emphasizes the generation of new knowledge during the learning process, requiring students to engage in information processing and inventive representation, develop a deeper understanding of knowledge, and ultimately achieve knowledge transfer (Sheng et al., 2017). Due to the assumption that there is a hierarchy in the taxonomy, i.e., a higher mode subsuming a lower mode, constructive behaviors require learners to be active or manipulative. However, being generative is the paramount characteristic of a constructive mode of engagement. In

other words, the outputs of generative behaviors should contain new ideas that go beyond the information given to distinguish them from the behaviors that are merely active or manipulative (Chi & Wylie, 2014).

Interactive Mode of Engagement. In the ICAP context, interactive engagement refers to a learner's interactions with a partner who can be a peer, teacher, parent, or computer agent, often through dialogues, which should meet two criteria: (i) both partners' utterances must be primarily constructive; and (ii) a sufficient degree of turn-taking must occur. Examples of this category of engagement include defending and arguing a position in dyads or small groups, asking and answering comprehension questions with a partner, debating with a peer about justifications, and discussing similarities and differences (Chi & Wylie, 2014). In their research on dialog patterns in peer collaboration, Chi and Menekse (2015) came up with five distinct dialogue patterns: passive-active, passive-constructive, active-active, active-constructive, and constructive-constructive, based on each partner's possible discourse contribution being passive, active, or constructive, and identified constructive-constructive as the dialogue pattern that promotes the greatest learning.

There are four main types of knowledge-change processes that the ICAP framework says underlie the four modes of engagement. These are storing, integrating, inferring, and co-inferring. It also assumes that different knowledge-change processes cause different changes in one's knowledge, resulting in different cognitive outcomes, such as being able to recall, apply, transfer, and co-create. As a result, a hypothesized order of learning outcomes is proposed: interactive > constructive > active > passive (ICAP). In sum, the ICAP hypothesis predicts that as activities move from passive to active to constructive to interactive, students undergo different knowledge-change processes, reaching different levels of cognitive outcomes, and, correspondingly, learning will increase (Chi & Wylie, 2014). It is noteworthy that the term active in ICAP is a label referring to one mode of engagement, whereas the term "active" in active learning is a broad term referring to all three modes (active, constructive, and interactive) of cognitive engagement (Chi et al., 2018).

Empirical Support for the ICAP Theory

Because engineering education did not have a way to group active learning methods used in schools, Menekse et al. (2013) did research to test the ICAP hypothesis by looking at how well interactive, constructive, active, and passive learning activities worked in materials science and engineering classes. Two studies were carried out to determine how and to what degree differentiated activities affected student learning outcomes; student knowledge and

understanding of materials science and engineering concepts were measured. The two studies' results showed that the ICAP hypothesis was right on the money. They also suggested that the ICAP taxonomy of overt learning activities could help researchers, instructional designers, and teachers come up with activities that are right for their research or lessons.

Chi et al. (2018) undertook a 5-year project that attempted to translate the ICAP theory into a theory of instruction. Research findings showed that although teachers had minimal success in designing constructive and interactive activities, students nevertheless learned significantly more through constructive than active activities. In addition, the study helped Chi and her associates ascertain the challenges they needed to overcome in their future ICAP research, such as developing methods to educate teachers to understand and convey to students what effective collaborative dialog patterns are and how to carry out such collaborative interactions.

The ICAP taxonomy of learning activities can serve as a tool to judge the effects of differential learning behaviors on students' learning outcomes based on the quality of learning activity design and the level of learning engagement (Chen et al., 2019). This overt-behavior-based cognitive engagement theory provides operational definitions for students' cognitive processes, facilitating its application in diverse learning settings (Sheng & Ding, 2018). Frontline teachers and instructional designers can use the ICAP framework to observe and analyze the modes of engagement behaviors of learners to identify problems with learning activity design, with the purpose of maximizing students' in-class engagement and interaction as well as enhancing the outcomes of learning activities (Sheng et al., 2017).

Holistic Module Learning in Shandong 271 Education Group

Shandong 271 Education Group, a private education group, runs 15 schools, including Shandong Changle No.2 Middle School, Weifang Experimental Middle School, Weifang Kuiwen Experimental Middle School, Weifang Xiashan Experimental Middle School, Weifang Meijia Experimental School, Weifang Xiashan Bilingual Primary School, Weifang Hansheng International School, the Middle School Affiliated to Yunnan Agricultural University, Yunnan Changle Experimental Middle School, Kunming Xingzhi Middle School, Nanjing Yutong Experimental School, Huai'an Diyishan Middle School, Binzhou Xingzhi Middle School, Jining Haida Xingzhi School, and Dong'a Nanhu Xingzhi School. In total, there are over 60,000 teachers and students in this education group (Zhao, 2019). The holistic module learning model was formed in the instructional reform of basic education in China. Numerous successful implementation cases have emerged, among which

Shandong 271 Education Group's practice is the most exemplary. The model has been well recognized as an effective instructional approach to encouraging active learning in students (Tao, 2023).

Definition of Holistic Module Learning

Holistic module learning is a student-centered teaching model that uses major concepts to re-integrate the learning materials and emphasizes the autonomy and integrity of learning. It facilitates students' mastery of fundamental theories, logical structure, and application value of subject knowledge and helps cultivate students' thinking ability through a comprehensive cognitive process involving self-directed study, dialogue, criticism, application, and generation (Zhao, 2022a). Holistic module learning is structured with modules rather than prescribed textbook units. To deploy modules for a course, teachers must first identify pivotal instructional objectives stipulated in the National Course Standards, establish major concepts based on these objectives, and then organize relevant learning materials into a relatively independent cluster (Zhang, 2023).

A Standardized Procedure for Holistic Module Learning

A standard classroom procedure for holistic module learning typically includes four stages: overall perception, inquiry and construction, application and transfer, and reconstruction and expansion.

Overall perception. Profound education results from the compelling experiences of students. Teachers should provide or create real-life situations for learning content so that students can truly experience the context of learning activities and be self-motivated to go for further inquiry. Learning objectives and tasks are designed based on the major concepts of the module in this first stage.

Inquiry and construction. Through self-directed and cooperative learning, students identify the knowledge, methods, and skills that should be acquired in the current module. They independently build the essential connections between knowledge points and skills. On that basis, students explore the logic behind knowledge and design the inquiry task.

Application and transfer. The application of knowledge and skills should be related to the needs of reality, and learning tasks should be designed to solve practical problems. In fulfilling tasks, students constantly review prior lessons and renew understanding, methods, and skills to generate new ones.

They also exchange ideas on newly generated knowledge, methods, and skills and apply them to new situations in social life to solve new problems. Such cycles of understanding and generation can continuously engender deeper insights into major concepts of the subject.

Reconstruction and expansion. Focusing on the major concepts in the module, students recall the learning process, check on the achievement of learning objectives, and summarize problem-solving methods. By examining the fulfilled tasks, the solved problems, and the new gains, students reconstruct their knowledge structure, build mind maps, and optimize learning methods for all subjects (Zhao, 2022b).

Validation of the ICAP Hypothesis by Holistic Module Learning

Educators with schools in 271 Education Group spot the compatibility between the holistic module learning model and the ICAP framework as their understanding of the theory advances.

Similarities between the Underlying Principles of Holistic Module Learning and the ICAP Theory

Emphasizing Students' Agency in the Classroom

According to the ICAP theory, engagement means capacity: as students' cognitive engagement advances from passive to active, constructive, and interactive, their thinking capacities also improve with the strengthening of their agency, and as a result, their learning outputs increase correspondingly (Sheng et al., 2017). The ICAP framework is therefore learner-centered in that it delineates learning outcomes as a function of the mode of engagement activities undertaken by the learners. Likewise, holistic module learning is a student-centered instructional paradigm, placing a premium on "cognitive internalization" and "generation and construction." Active learning strategies such as self-directed study, collaborative group learning, and inquiry-based learning have been heavily employed in holistic module learning. Task-driven learning, situational experience, autonomous inquiry, and promotional transfer are its main features. The model aims to foster the internal motivation for a student to learn rather than being forced to study (Gao, 2018).

Advocating Structured Learning

Four types of engagement behaviors are mapped to different knowledge-change processes in the ICAP framework. These are storing information separately, activating relevant prior knowledge, integrating new information with prior knowledge, and drawing conclusions from it. Different knowledge-change processes elicit varied changes in the learner's knowledge, resulting in different cognitive outcomes, such as the abilities to recall, apply, transfer, and co-create (Chi & Wylie, 2014). The primary purpose of the holistic module learning model is to overcome the fragmented way of learning in the traditional instruction paradigm. It advocates that teachers and students should build a systematic and holistic view of knowledge for all subjects. In this learning model, students use major concepts to integrate separate knowledge, skills, and methods to obtain a persistent and transferable understanding of knowledge (Zhao, 2022b). A switch from fragmental to structured learning takes place, enhancing students' learning efficiency and effectiveness and providing a foundation for student active learning (Zhou, 2022).

Recognizing the Hierarchical Nature of Cognitive Engagement

There is a hierarchy in the ICAP taxonomy, so a higher mode of engagement subsumes a lower one. That is, interactive behaviors subsume constructive behaviors, and constructive behaviors subsume active behaviors. Accordingly, the knowledge-change processes for each higher mode subsume the processes for the lower mode (Chi & Wylie, 2014). Constructive learning behaviors occur when personal judgments and insights are generated on the basis of activated prior knowledge; constructive engagement is upgraded to interactive engagement when the peer's or peers' ideas are integrated. In this process, shallower learning is developed into deeper learning (Sheng et al., 2017). Such cognitive regularity also underlies the process of holistic module learning. "Overall perception" is the preliminary construction of basic knowledge; "inquiry and construction" is the second stage of construction based on the initial one; "application and transfer" is the third phase of knowledge construction built on the preceding ones; and "reconstruction and expansion" is the fourth stage, involving higher-order thinking skills such as inference (Zhang & Wang, 2022).

The Implementation Strategies of Holistic Module Learning Reinforce the ICAP Hypothesis

Ensuring Student in-class Engagement through Well-designed Learning Protocols

As the ICAP theory predicts different levels of learning as a function of different modes of engagement across various activities (Chi et al., 2018), schools with 271 Education Group place special emphasis on activity design in creating learning protocols to maximize student cognitive engagement. Well-crafted learning protocols play a vital role in the successful implementation of holistic module learning. These schools reorganize course contents by developing holistic module learning protocols, also referred to as "271 learning protocols." Holistic module learning protocols are systematic, structured, and smart instructional plans that support student learning. 271 learning protocols adhere to the following principles that guide the design of student learning activities (Liu, 2022):

Boosting Students' Self-motivation to Study. The critical criterion of activity design is self-driven, i.e., establishing the internal motivation to learn rather than being forced to study. An ideal learning task can turn monotonous, unfamiliar knowledge into appealing, challenging activities and pique students' interest in learning. Students' quests for additional knowledge and skills increase after they complete the work.

Pointing to the Cultivation of Student Key Competencies. Well-designed activities are beneficial for fostering students' core abilities and essential characters. In the process of completing learning activities, students naturally build their own knowledge structure, improve learning methods and skills, and, as a result, develop key competencies.

Developing Higher-Order Thinking Skills in Students. Higher-order thinking refers to intellectual ability based on higher levels of cognitive processing. Higher-order thinking skills include synthesizing, reasoning, comprehending, applying, evaluating, and more. In 271 learning protocols, learning activities are of a sufficient level of difficulty and challenge to elicit significant thought and careful execution to encourage student higher-order thinking.

Posing Open Questions. Open questions are questions that cannot be addressed with "yes" or "no" answers or ready solutions from textbooks. Activities with open, heuristic questions can instigate deeper thinking about prior knowledge and curiosity about new areas to be explored in students.

In addition, evaluation in holistic module learning is a combination of formative and summative assessment. Assessment scales and quizzes are embedded in learning activities. Teachers judge student learning outcomes by the

results of the two forms of assessment and make necessary adjustments and modifications for their instructional plans (Liu, 2022).

Optimizing Learning Outcomes through Collaborative Group Learning

The ICAP theory introduces the idea that different modes of interacting with the learning materials lead to different levels of learning outcomes, with the collaborative/interactive mode having the potential to produce the deepest learning among the four modes of engagement activities (Chi et al., 2018). According to ICAP's definition of interactive engagement, being interactive requires that each person in the group contribute constructively. Dialogues are truly interactive only if each speaker's expressions generate some knowledge beyond what was presented in the original learning materials and beyond what the partner has said. Thus, all group members need to be constructive. In addition, a dialogue must have a sufficient frequency of turn-taking to meet the definition of interactive. It is not very interactive when one partner dominates and generates most of the substantive contributions and the other partner merely agrees or contributes with passive responses (Chi & Wylie, 2014).

Collaborative group learning is a pivotal strategy for implementing holistic module learning. In schools with 271 Education Groups, the study group is the fundamental building block of classroom structure. There are several measures in place to guarantee high-quality, productive interaction taking place in group studies.

- The organization of study groups follows the principles of homogeneity between groups and heterogeneity within the group, which means each group consists of members of different academic levels, thinking dispositions, learning styles, interests, genders, and personalities. Generally, a study group is made up of four students. Both individuals and the group have the option to determine the composition of the group. In addition, there is a specialty study group for each subject, composed by one student from each study group. As a result, everyone in the class has a specialty study group to join. They are assistants for teachers and academic leaders for group members in their respective subjects. Before class, the specialty study group leader organizes discussions on learning materials and learning activities for the current module to formulate the learning plan, objectives, and strategies, and then the specialty study group members transmit the agreed plan to each study group. In class, self-study, cooperation, and inquiry are conducted alternately. Everyone has the

equal opportunity to represent their ideas, and finally the solution to a specific question or issue is reached within the group (Zhao, 2022b).

- Nevertheless, group activities in class can be disorderly and ineffective; students often spend time chatting about things irrelevant to the lesson. Such group work wastes classroom learning time, and students fail to achieve the objective of cooperative learning. To address the issue of classroom order and engage students in real interaction, detailed specifications for in-class activities are devised in learning protocols. Teachers and students use dialogues and discussions to carry out inquiry cooperatively according to the prescribed question and activity chain to ensure maximal amounts of interaction between group members and between students and teachers (Wang, 2022).
- All collaborative learning is goal-oriented. Classroom activities are organized to solve specific problems, avoid aimless extension, and guarantee the accomplishment of the teaching plan. The evaluation of academic achievement is based on group performance. Each student's academic results are connected to the combined achievements of all group members. With this evaluation system, students are motivated to make optimal contributions to intra-group interaction (Hua, 2023).

Conclusion

ICAP is a comprehensive theoretical framework for active learning and a student-centered theory, as it focuses on studying how students' engagement with instructional materials is related to their learning products. The ICAP hypothesis has been validated through many classroom and laboratory studies and thus can serve as a guide for lesson plans.

The ICAP theory provides a novel lens for the reform of curricula and instruction in Chinese education. At present, there is a paucity of ICAP research, particularly empirical studies, in China. Shandong 271 Education Group's practice of holistic module learning can serve as evidence supporting the ICAP theory. At the same time, it is noteworthy that there is also insufficient empirical research on holistic module learning, despite the instructional model having been implemented in schools affiliated with 271 Education Group for many years and having generated significant achievements. It is hoped that this article can spark more research on ICAP's application in Chinese education as well as on how to improve holistic module learning by drawing on the ICAP theory.

References

Chen, J., Janzen, D., McGaughey, K., & Widmann, J. (2019). Tracking learning engagement at the student level. In 2019 IEEE Frontiers in Education Conference (FIE) pp.1-5. IEEE. DOI: https://doi.org/10.1109/FIE43999.2019.9028617

Chi, M. T. (2009). Active‐constructive‐interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, 1(1),73-105. DOI: https://doi.org/10.1111/j.1756-8765.2008.01005.x

Chi, M. T., Adams, J., Bogusch, E. B., Bruchok, C., Kang,S., Lancaster, M.,...& Yaghmourian, D. L. (2018).Translating the ICAP theory of cognitive engagement into practice. *Cognitive Science*, 42(6):1777-1832. DOI: https://doi.org/10.1111/cogs.12626

Chi, M. T., Bassok, M., Lewis, M. W., Reimann, P., & Glaser, R. (1989). Self-explanations: How students study and use examples in learning to solve problems. *Cognitive Science*, 13(2), 145-182. DOI: https://doi.org/10.1016/0364-0213(89)90002-5

Chi, M. T., De Leeuw, N., Chiu, M. H., & LaVancher, C. (1994). Eliciting self-explanations improves understanding. *Cognitive Science*, 18(3):439-477.

Chi, M. T. H., & Menekse, M. (2015). Dialogue patterns that promote learning. In L. B. Resnick, C. Asterhan, & S. N. Clarke (Eds.), Socializing Intelligence through Academic Talk and Dialogue (Chi. 21, pp. 263-274). Washington, DC: AERA. Available at: https://www.torrossa.com/en/resources/an/5327590#page=274

Chi, M. T., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist*, 49(4):219-243. DOI: https://doi.org/10.1080/00461520.2014.965823

Gao, J. (2018). Physical education design in 271 Education Group aimed at developing student key competences. *Sports*, 2018(19):119-120. Available at: https://kns.cnki.net/kcms2/article/abstract?v=JhhVyKSVrEiQA3V05fsqL3IQQaViPPR5ORWIpNlLDT3HJV5yx2zwpY1MhxLdQ3cXIF_HGJmZiYkQZvwL5_AFTqpS6Vri0T-2YMkqS05FuIEGEMRUnwoBeZQ9oH3oZC5ukDVWD2_IolQ=&uniplatform=NZKPT&language=CHS

Gu, M. (2017). The modernization of education requires the building of both teaching and research forces. Beijing Mingyuan Education Academy. Available at: https://www.sohu.com/a/124775270_507403

Hua, M. (2022). Pathways to successful transformation of basic education amid educational crises: A case study of the experiments in educational reform by 271 Education Group. *Science Insights Education Frontiers*, 13(2):1899-1909. DOI: https://doi.org/10.15354/sief.22.or076

Liang, D. (2023). Winners of the Yidan Prize in 2023. China Education News Web. Available at: https://baijiahao.baidu.com/s?id=1778295878687268334&wfr=spider&for=pc

Liu, S. (2022). A Case Study of 271 Education Group's Learning Protocols: Reconstruction of Course Contents Based on Holistic Module Learning. *Science Insights Education Frontiers*,13(1):1837-1844. DOI: https://doi.org/10.15354/sief.22.or068

Menekse, M., Stump, G., Krause, S., & Chi, M. (2013). Differentiated Overt Learning Activities for Effective Instruction in Engineering Classrooms. *Journal of Engineering Education*, 102:346-374. DOI: https://doi.org/10.1002/jee.20021

Sheng, Q. & Ding, X. (2018). Evidence based research on the ICAP taxonomy of learning activities. *Journal of Wuhan University of Science and Technology (Social Sciences Edition)*, 2018(02):218-223. Available at: https://kns.cnki.net/kcms2/article/abstract?v=PhqKDHt8vRA85v76LB1BfxxPTbRwgCEPAjvPWwjBjLSGhWuTK14dtopYMeKMHuFr2I9A-YJWDj__K62sYDA36CHE96LXh0kTH4W45MnIM3DeoFLUb8zELZH5vEHkHS8r_LApwip4_Tg=&uniplatform=NZKPT&language=CHS

Sheng, Q., Ding, X., & Teng, M. (2017). Engagement is capacity: An overview of research on the ICAP taxonomy of learning engagement behaviors and value analysis. *Open Education Research*, 2017(02):46-54. DOI: https://doi.org/10.13966/j.cnki.kfjyyj.2017.02.005

Tao, J. (2023). A brief introduction of the history of Shandong 271 Education Group and its president Fengping Zhao. *The New Campus*, 2023(2):4-8. Available at: https://kns.cnki.net/kcms2/article/abstract?v=18Spvz_s8rEG6y1J95otxU2XcyrmpqH_hfoxg9Tiur1ONfSHtaHGq4zqsOX5ksYs9LBC8airgM0TM2Dav-4nRLdUmNzy2nEWDDkQSQ1CkPzxQuBM6HQsqIxhFpQj1CbKud5RXcikLDY=&uniplatform=NZKPT&language=CHS

Wang, J. (2022). Let students engage in real learning: An evaluation of protocol-guided learning. *Science Insights Education Frontiers*, 12(1):1691-1696. DOI: https://doi.org/10.15354/sief.22.re063

Zhang, G. (2023). A practical exploration of the holistic module learning model. *Science Insights Education Frontiers*, 17(1):2677-2686. DOI: https://doi.org/10.15354/sief.23.re241

Zhang, H. & Wang, Q. (2022). Delving deeper into in-class instruction: Exploration of holistic module learning in Chinese language teaching. *Life Education*, 2022(23):80-83.

Zhao, F. (2019). How to innovate and implement an education system for student comprehensive development: Implications of Shandong 271 Education Group's instructional reform. *People's Education*, 2019(Z3):82-85. Available at: https://kns.cnki.net/kcms2/article/abstract?v=tYqgYjzYKsC6i0YxMT_LncdGPs0j2tZtvs9p3SbNHHc3y3xkoTMEgipbTalFF54wZ2CCEdMKJRPMmYnMp24KpXLE1b_bZm-R5U_WnLaZzxwa7oYYx0O5VB4vNomtlfmOe-mRbZ60wVg=&uniplatform=NZKPT&language=CHS

Zhao, F. (2022a). Holistic module learning: An experiment in teaching reform of basic education in China. *Science Insights Education Frontiers*, 11(1):1475-1483. DOI: https://doi.org/10.15354/sief.22.or003

Zhao, F. (2022b). A Revolution of Classroom Learning: Successful Practice of Holistic Module Learning. Qingdao: China University of Petroleum Press.

Zhou, L. (2022). Holistic module learning: A revolution in classroom teaching. *Science Insights Education Frontiers*, 11(1):1471-1474. DOI: https://doi.org/10.15354/sief.22.co002

Received: 27 August 2023
Revised: 14 September 2023
Accepted: 05 October 2023