Research on the Self-improvement Path of Teachers' Information Literacy from the Perspective of Multimodal Teaching

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Abstract. Multimodal teaching is one of the ways to accelerate the development of information education and intelligent education. In order to meet the requirements of multimodal teaching on teachers' own abilities, teachers need to improve their information literacy from both practical and cognitive levels: first, teachers should pay attention to the self-training of their multi-literacy, including basic ICT practical skills and the critical use of multimodal technology tools. Second, teachers have to solve their own cognitive challenges in information literacy, by raising their understanding level and autonomy consciousness of multimodal meaning-making supported by information technology on the basis of multi-literacy skills across disciplines.

Keywords: Information Literacy · Multimodal Teaching · Multi-literacy · Meaning-making · Digital Media

1 Introduction

At present, China's teaching reform has entered a new stage of education modernization and informatization. With the support of information technology, the communication mode of teaching resources presents a development trend from the work of single reading channel to the collaborative processing of multiple perception channels. The multimodal teaching mode has become a popular issue in the research and practice of improving education quality. Multimodal teaching emphasizes the deep integration of teaching contents and resources with a variety of symbol systems (online and offline) (Liang, 2016), which deepens students' understanding and mastery from various sense modalities with the help of online tools and network platforms. In this context, it puts forward higher requirements for teachers' information literacy level. Accordingly, it is necessary for teachers to improve their information literacy and acquire the necessary multi-literacy ability, so as to effectively design and implement teaching methods in the multimodal situation.

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2 Analysis on the Relationship Between Multimodal Teaching, Multi-literacy and Information Literacy

Multimodality refers to different forms of communication that, with the help of language, image, sound, action and other symbolic resources as communication media (Baldry & Thibault, 2006; Zhu, 2007), are generated to jointly construct meaning through multiple perception channels such as hearing, vision, touch, smell and taste (Cao, 2015). In the actual teaching process, the two-way feedback interactions between teachers and students rely not only on the independent operation of a single modality, but also on the interworking and collaboration between multiple modalities (Zhang & Li, 2012). Multi-literacy is mainly regarded as the ability to acquire and process information in multimodal situations (Zhu, 2008), including cultural literacy and technical literacy (Hu, 2007). With the in-depth application of information technology in the field of education, it is increasingly necessary to improve the technical literacy (also known as information literacy) ability of teachers and students (Zhang, 2012), which directly affects the efficiency and effect of multimodal meaning-making by teachers and students using technical tools and information resources, and thus indirectly affects the quality of multimodal teaching.

Consequently, the current training path of multi-literacy should focus on the coordinated development of cultural level, consciousness level and skill level, which also coincides with the improvement requirements of information literacy (Liu, 2020). Information literacy at the cultural level involves expertise in the respective subject area, while information literacy training at the consciousness and skill levels may be interdisciplinary, which can be seemed as the object of discussion in general. The following will explain the self-improvement path of teachers' information literacy by analyzing how teachers exercise their multi-literacy ability in consciousness and skills.

3 Theoretical Support for Self-improvement Path

The "multiformity" of multimodal teaching is reflected in the diversification of communication channels, symbol systems, information media and resources and supporting technologies (Wang, H. J. & Wang, H. L., 2015). As a result, for many teachers who pay special attention to personal professional development but ignore basic ICT (i.e., Information and Communications Technology) skills, exploring and utilizing the instructional potential of digital media and network technology to conduct multimodal teaching activities is a challenge not only in practice but also in cognition (Slaouti & Fay, 2006). It means that teachers have to equip themselves with both a direct, technology-specific application experience and a transferable mental reserve for multimodal meaning-making (e.g., critical thinking, non-linear thinking, systematic concept, etc.).

At the practical level, the skills gap between teachers and recent students with more computer experience can be bridged by participating in technical training. Hampel and Stickler (2005) emphasize the necessity of training teachers' technological competences: 'the initial and continuing staff education' which focuses on 'software-specific application and the affordances of the medium' can be identified as a solution to teachers' basic technical difficulties. As Salmon (2003) claims that 'any significant initiative aimed at

changing teaching methods or the introduction of technology into teaching and learning should include effective e-moderator support and training, otherwise its outcomes are likely to be meagre and unsuccessful'. The lack of teacher training in the practical application of technology is considered to be one of the reasons for reducing the efficiency and quality of multimodal teaching, and acquiring ICT skills in applying multimodal technology tools and media is one of the desired goals of the development of multi-literacy ability (Fuchs et al., 2012).

At the cognitive level, teachers need to first raise their consciousness of multimodal meaning-making to a certain level, as well as cultivating the initiative to use information technology to assist multimodal teaching, so as to further improve students' multimodal learning effect. For recent students who are familiar with the use of digital media in private contexts (e.g., entertainment and social) and possess basic digital and media literacy, the issues that need to be considered with respect to the application of specific technical tools or digital media here include not only its acquisition and use on a daily basis, but also how to transfer it as well as the skills to manipulate it into an educational context. Therefore, teachers have to first deepen their own understanding of multimodal meaning-making, and take this as a way to develop their autonomy in using digital media and tools to construct multimodal meaning system, so as to guide students to understand and make use of the learning potential of these technologies involved in the instructional materials, thus to improve students' willingness and efficiency in learning through multimodal technical tools. Palfreyman (2006) argues that such informed use of information tools in educational contexts can be achieved through the cultivation of multi-literacy skills.

4 Specific Implementation Scheme of Self-improvement Path—Taking the University of Manchester as an Example

4.1 Seek ICT Skills Training and Develop a Sense of Critical Use of Technology

In the practice of multimodal teaching, teachers' ability to properly apply digital media and tools should not be assumed as a given by default, but still need to be acquired through ICT professional skills training. The University of Manchester (hereinafter referred to as the "UoM") mainly assists teachers to improve their own information literacy by combining the support of the integrated teaching e-service platform with offline teacher training (lectures or seminars). According to the "Education Informatization 2.0 Action Plan" issued by the Ministry of Education of China, the current main task is to facilitate the development of teachers' information literacy expanded from technology application to ability and quality promotion, and encourage teachers to update their concepts, reshape their roles, improve their quality and enhance their ability (The Ministry of Education, 2018). As a result, the training content of ICT skills in multimodal context needs to contain not only the basic skills and methods related to technology application, but also the concept establishment of critical use of technical tools, so as to comprehensively improve teachers' multimodal teaching ability. Specifically, the training should first involve the cultivation of multi-literacy skills. The training content is expected to be as comprehensive and universal as possible to help teachers master the necessary

digital literacy skills. UoM has not only built a comprehensive teaching software library on its integrated teaching e-service platform and encourages teachers to post application experience exchange videos on the platform, but also occasionally invites experts from outside the university to carry out lectures or seminars on cutting-edge teaching technologies. Although UoM has provided a wide range of information literacy training resources for teachers, it has not explored a deeper level of effective training content. Training should ensure that technology is properly embedded in the instructional materials to adequately support students' learning, rather than simply trying to assume an instructional scenario to inform teachers how to use specific media and tools to teach a specific course (Thach & Murphy, 1995). Therefore, in order to enable teachers to maximize the support role and benefits of technology in multimodal course design, the training for teachers should also focus on the critical use of technical tools.

By reflecting on the possibilities and limitations of the available tools, teachers have to ensure that the technology most suitable for the instructional objectives at the current stage is used to effectively support students' multimodal learning process. Bruce (2008) states that the primary interaction in the transformational use of media and tools is to consider their potential and constraints in the current context. If teachers want students to see the affordances of technology in supporting multimodal learning, such as collaborative learning, academic communication and meaning-making, teachers first need to clarify the intended instructional effect to be achieved, and then find out which tools can assist in achieving this teaching goal (i.e., the teaching potential of the technology), so as to optimize the matching between the two. When it comes to the application of specific multimodal teaching tools, teachers at UoM usually choose to seek help from relevant companies outside the school, such as maintaining continuous contact and communication with their function designers, so as to obtain the latest information (such as function update and system upgrade) for subsequent use.

In terms of the limitations of technology, with the wider application of e-learning resources in multimodal daily teaching, more teachers are accustomed to introducing digital tools and media via hypertext links in online instructional materials to support students' after-school self-study, but the large amount of information contained in hypertext links is likely to cause cognitive overload among students. On the contrary, it may reduce students' immediate understanding efficiency and willingness to learn. In view of this limitation, teachers need to pay extra attention to the development of their own hypertext literacy in the dimension of multi-literacy, that is, the ability to judge the content of hypertext links through context and effectively use the information navigation function of links (Pegrum, 2009), so that teachers are able to reasonably guide the improvement of students' hypertext literacy as well. Meanwhile, it is conducive to avoiding the potential adverse impact on students' multimodal online learning due to ill-structured teaching materials caused by teachers' inadequate multi-literacy ability.

4.2 Improve the Cognitive Level and Autonomy Consciousness of Multimodal Meaning-Making Supported by Information Technology

By promoting the development of multi-literacy, teachers can enhance their cognition of multimodal teaching environment and meaning-making model, and thus to improve the phenomenon of emphasizing denotation over connotation in the current teacher team

construction. As mentioned above, although teachers at UoM are able to acquire basic information literacy and practical ability through training and consultation, the intangible understanding of the connotation of information literacy at the consciousness level still requires the accumulation of teachers' own experience and experience. Understanding how to use information technology combined with multimodal education context to innovate the channels and methods of meaning-making is the key to fundamentally raise the quality of multimodal teaching (Kress, 2012). In this case, by acquiring the ability to 'manipulate and transform' multimodal technical tools and digital media (i.e., multi-literacy skills, including intercultural communication ability and interdisciplinary knowledge processing ability, etc.), teachers are able to show multimodal meaning-making through the 'intentional deployment' of technology in the task configurations, so as to form effective and systematic multimodal course resources and improve students' multimodal learning effect (New Media Consortium, 2005).

Firstly, teachers should develop their own autonomy consciousness of using information technology to assist multimodal teaching. This is the basis for teachers to further enhance their information literacy at the cognitive level after mastering practical multi-literacy skills, which primarily relies on teachers' self-cognition and self-requirements. This autonomy consciousness not only includes the initiative to reasonably embed multimodal technology into the teaching process and instructional resources, but also contains an in-depth understanding of how the information conveyed by technology helps students to construct knowledge. Secondly, teachers also need to have the cognition to connect the goal of meaning-making with the purpose of using each technical tool. When designing teaching plans, teachers should consciously split up multimodal course learning into staged tasks driven by continuous meaning-making demands. Different teaching stages may present their own emphasis on knowledge construction, and correspond to the application of different multimodal technologies, to form efficient meaning transmission channels and meaning-making models, which is conducive to building systematic knowledge structure. Therefore, in order to improve teachers' information literacy at the cognitive level, teachers are expected not only to master the prominent functions of specific tools, but also to be aware of connecting them with teaching demands.

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