A Hybrid Golden Course Instructional Design Intervention Model Based on Self-Regulation Theory

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Abstract: The standard of a golden course should be characterized by advanced, innovative, and challenging features, with its primary objective being the attainment of deep learning. In online-to-offline hybrid teaching, online learning comes first, while offline is the re-application and expansion of online knowledge. Therefore, the widespread participation of the online segment has an important impact on the implementation of deep learning. This paper focuses on the online part of blended teaching, combined with self-regulated learning theory, and gives intervention strategies for online teaching. Using a web design course as an example, this paper elucidates the significant improvement effect of a blended teaching intervention strategy which based on the self-regulation model on students' engagement with online content. It is provides theoretical support and a case study for the implementation of hybrid golden course.

1. Introduction

Although the education in the "Internet +" era is not like the first year of MOOCs in 2012, which advocated that "online education will replace the current offline education, and the profession of teachers is about to face a large number of layoffs," it does have a certain impact on our teaching. The undeniable role of technology in promoting education can only be truly realized through its integration with practical applications and effective implementation. Over the course of 12 years, we have been extensively investigating the profound integration between technology and education. By integrating MOOCs, SpoOCs, flipped classrooms, blended learning, and blended gems, we are approaching the pinnacle of technological advancements in education. The real realization of the mixed Golden Course goal of "advanced, innovative, and challenging" undoubtedly becomes the most powerful proof of the deep integration of technology and education [1].

The essence of the Golden Course is to implement deep learning. As Professor Anfuhai emphasizes, Deep learning is a type of learning based on understanding where learners aim for higher-order thinking and practical problem solving. It involves actively and critically integrating new knowledge, ideas into one exists cognitive framework and the ability to translate existing knowledge into new contexts [2]. Therefore, critical thinking, integrating new knowledge, and making new connections are essential components of deep learning. It facilitates personal comprehension of the content and empowers students to theorize by amalgamating it with their own

meaningful context or existing prior knowledge. Additionally, it enables students to accomplish tasks and derive extensions and exceptions through establishing relationships between hypotheses and other known or intriguing elements.

After the debut of the national "Five Golden Courses" on November 30, 2020, this hybrid golden course, which integrates the advantages of traditional face-to-face teaching and online teaching, has become the most potential platform to promote innovation and reform in the school. The successful implementation of online teaching is pivotal in blended instruction, as it determines the attainment of the "advanced, innovative, challenging" objective for the golden course. Due to the requirement of engaging in a series of activities such as video watching, quiz taking, and forum discussions on the online platform, the offline stage serves as an extension and practical application of the acquired knowledge. Hence, fostering a high level of online engagement is crucial for effectively implementing deep learning."

Based on the characteristics of online learning, this paper designs an intervention model and gives some strategies to provide theoretical support and practical cases for the goal of "advanced, innovative, challenging" of hybrid golden course.

2. Characteristics of Online Learning

1). Learners acquire increased autonomy.

Online learning offers learners a flexible and autonomous learning schedule, unrestricted by temporal or spatial constraints [3]. For instance, in a typical course week, video lectures are typically provided to deliver the course content, followed by discussions aimed at fostering critical thinking and an assessment of acquired knowledge. However, learners have the freedom to engage with course activities in any order they prefer; they can choose when to watch video lectures and which specific activities to complete, while also having the option to skip certain tasks.

2).The online system is capable of capturing and storing learners' data throughout the entire learning process.

Upon the learner's interaction with the online course activity, the online system proficiently captures and aggregates learning traces, encompassing data on various activities such as video consumption, specific segments of videos frequently revisited, and completion status of assignments. These meticulously collected data genuinely reflect learners' personalized learning experiences, which are further analyzed by instructors in blended teaching settings to fine-tune offline instructional strategies.

3). Learners exhibit diverse patterns of engagement in online learning.

Certain scholars conduct empirical investigations on learners based on their performance in online learning environments. It was observed that learners exhibit diverse patterns of engagement in the context of online learning. Kizilcec et al. classify these learners into distinct groups, namely "high achievers," "latecomers," "almost there," "school-leavers," "auditor," and "system participants." Both "high achievers" and "latecomers" demonstrated high levels of engagement by successfully completing the majority of assessment tasks. The sole distinction lies in the fact that "high achievers" adhered to assignment deadlines, whereas "latecomers" submitted their work belatedly. The "almost there" learners consistently participated in assessment activities but dropped out before the end of the course. School-leavers are those who give up after completing about three to four assessments and visiting half of the course. "Auditor" participate primarily by watching videos, while "system players" are more holistic in their behavior, including participating in assessment activities rather than just watching video content. However, the last two groups of people only participate in certain types of course activities selectively and do not fully benefit from the content provided by the whole course.

In summary the learning effectiveness of learners in online education varies based on their level

of course engagement, which is contingent upon their self-regulated learning abilities. This paper aims to address the core issue of intervening in learners' self-regulation abilities to promote active participation in online courses, aligning with the sequential structure of course materials and facilitating deep learning. By maximizing the benefits of online education and elevating offline courses to their zenith, this study strives to achieve the goal of golden course.

3. Self-Regulating Learning Theory

Self-Regulation Learning encompasses various dimensions of learning, including motivation, metacognition, cognition, emotion, and behavior. Zimmerman's SRL model illustrates the learning process through three sequential cycles: pre-consideration, performance, and self-reflection [4] (Figure 1). In the pre-consideration stage, learners conduct task analysis, set goals, and make plans before they begin learning, and self-motivated beliefs influence the realization of these goals and plans. Following this pre-contemplation phase, learners progress to the performance phase where they execute their plan through exercising self-control and self-observation. To effectively learn, learners manage their time, construct their environment, and utilize effective learning strategies while monitoring their progress. Upon completion of the self-reflection phase, learners' progress is evaluated based on information obtained from metacognitive monitoring during the performance phase as well as feedback received. Learners reflect on their goals, plans and strategies using this information to form new objectives.
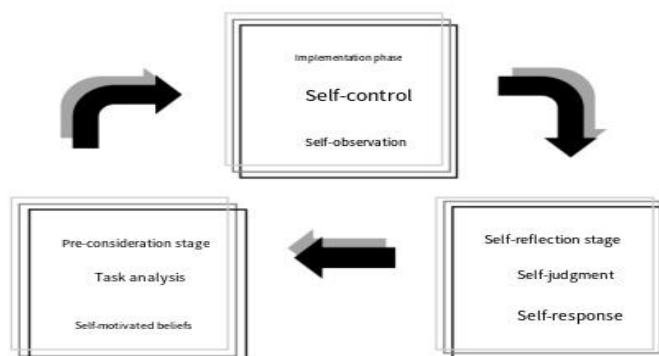

Figure 1: Self-regulation Model (SRL) proposed by Zimmerman

4. Instructional Design Intervention Model Based on Self-Regulation Model

The general framework of online learning encompasses three key components: video lectures, quizzes, and online discussions. These elements also form the basis for the instructor's online teaching design. Typically, teachers upload study videos to the designated area and administer objective test questions upon completion of each unit's video study. In the discussion area, instructors propose predetermined topics for students to engage in meaningful discourse by responding to posts. It can be observed that in previous designs of online courses, these three parts were largely isolated from one another without significant interdependence. As previously mentioned, learners who strive for higher online learning scores tend to focus solely on meeting the requirements for a passing grade. However, these "system players" may not fully benefit from the course content as they are guided by the teacher to complete tasks rather than engaging in deep thinking and critical analysis. For highly operational courses, completing online teaching tasks may only result in limited knowledge comprehension. Therefore, how can offline courses once again achieve the goal of the golden course?

Jansen et al. emphasized that the integration of self-regulated learning (SRL) interventions can enhance students' ability to regulate their own learning and consequently improve their academic performance [5]. In conjunction with the self-regulation model, this paper employs a range of strategies to intervene in learners' self-regulation within the context of online education design, and establishes the self-regulation intervention model as depicted in Figure 2. The objective is to establish interdependence among different components of the online course, fostering a systematic approach towards studying by adhering to the sequential order of course materials and actively engaging in platform tasks, thereby promoting profound contemplation and facilitating offline deep learning.
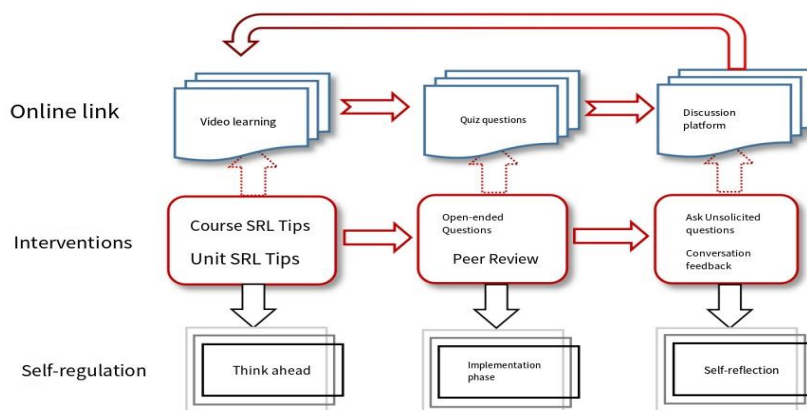

Figure 2: Instructional design intervention model based on self-regulation model

The specific intervention measures encompass the integration of self-regulated learning (SRL) prompts during the video-based learning phase, incorporation of subjective operational questions within the online testing stage, and implementation of peer evaluation functionalities. Within the discussion platform, students are encouraged to initiate meaningful discussions spontaneously while others are prompted to respond to posts that pique their interest. Simultaneously, teachers provide timely follow-up feedback aimed at transforming a post into an in-depth inquiry and stimulating profound thinking among students. Consequently, this fosters an environment where knowledge creation and free discourse can flourish.

4.1 Video Learning -- SRL Tips

The first component of online learning entails video instruction, which is often fragmented for the convenience of students. However, this fragmentation hinders students' ability to comprehend the material holistically and develop a systematic knowledge framework. Furthermore, it obscures the intended teaching objectives upon completion of each unit. To address these issues, incorporating prompts within the videos enables students to gain a macro-level understanding of the entire course and individual lessons during pre-consideration stages. This facilitates task analysis and self-motivated adjustment, thereby enhancing their capacity for self-regulated learning.

4.2 Subjective Operational Questions and Peer Evaluation Were Employed in the Test

The majority of conventional online test questions are objective in nature, with a greater emphasis on assessing theoretical knowledge. However, upon completion of these tests, students often only grasp certain theoretical concepts, which falls short for computer courses that require high practicality. Therefore, it is essential to incorporate subjective operational questions to enable students to develop a deeper understanding of practical application and encounter challenging

scenarios. These difficulties can serve as focal points for teachers' comprehensive exploration and explanation during class sessions, thereby achieving enhanced pedagogical depth.

The online subjective operation questions are evaluated through peer assessment, thereby significantly enhancing students' cognitive feedback and their ability to reflect and think critically. Moreover, for learners with a high level of metacognitive self-regulation ability, peer assessment plays a more prominent role in fostering the comprehensive and profound construction of their cognitive structure [6].

4.3 Discussion Platform - Take the Initiative to Ask Questions and Provide Feedback Through Dialogue.

Feedback is an integral part of the teaching and learning process, with "conversational feedback" emphasizing the importance of interactive communication between providers and receivers beyond initial feedback. According to Carless, conversational feedback involves sharing interpretation, negotiating meaning, and clarifying expectations rather than simply passing information from provider to receiver. Online discussion platforms are ideal for facilitating conversational peer feedback due to their interactivity and sense of community. These platforms provide opportunities for collaborative interaction among students that can lead to new knowledge creation and serve as a form of collaborative learning. Such conversational feedback can motivate students in self-exploration and guide them in self-regulation.

5. The Implementation of a Self-Regulating Model in the Context of Web Design

5.1 Strategies for Improving SRL in the Course

Before the commencement of the online course "Web Design," we have meticulously crafted an introductory video guide to familiarize students with the course's teaching objectives, content structure, chapter organization, assessment protocols, and instructional progression. This comprehensive overview aims to facilitate students' holistic understanding of the course and positively influence their preliminary considerations within the self-regulation model. The chapter-specific video guides expound upon each module's content design on the platform, encompassing pedagogical strategies for individual chapters, key concepts and challenges, learning objectives, mind mapping techniques, instructional procedures as well as recommended textbooks and assignments. While the course guide videos assist students in formulating long-term learning plans, chapter guide videos aid them in establishing short-term goals and action plans. The amalgamation of these two goal-setting approaches is instrumental in achieving ultimate success in this course. It is crucial to emphasize that both types of video guides should be designated as mandatory viewing materials to ensure their efficacy [7].

As a multimedia teaching tool, videos are visually engaging when played; however, it is not easy to find a certain content after the video is played. Therefore, in our SRL tips, each video is meticulously explained with a title, introduction, specific content breakdown for each time period, relevant knowledge points covered, and the lecturer's information. These comprehensive video descriptions are typically placed below the corresponding video to serve two crucial purposes: firstly, enabling students to grasp the video content beforehand for better organization of ideas and enhanced knowledge retention; secondly, facilitating quick access to required content when referring back to relevant knowledge points later on. Considering that seamless integration of online modules forms an essential part of our intervention model aimed at establishing a closed loop system for effective self-regulated learning improvement; reviewing and replaying videos becomes imperative.

5.2 Examination Items within the Curriculum

There are two types of subjective operational question designs, namely closed and open-ended questions. Closed operation questions provide students with all necessary materials such as text, pictures, audio, and video. Students are required to strictly adhere to the provided standards in order to complete web page production, with their final score assessed based on similarity to a standard sample. These types of questions primarily assess students' ability to implement and apply theoretical knowledge from the lecture, as well as their observational skills. Understanding video content and independently applying knowledge represent different levels of competence; it is only through facing challenges in practical operations that students can deepen their understanding of theory.

In order to enhance students' self-regulated learning abilities, we employ peer evaluation as a means of assessing closed operational questions. Through individual practice, each student gains a clear understanding of the specific aspects to focus on when evaluating their peers' work and develops internalized criteria for assessment. Simultaneously, the evaluation process enables students to identify both strengths and weaknesses in their peers' work, thereby fostering a greater sense of responsibility towards their own learning [8].

For open-ended tasks, teachers are only required to provide the final grading criteria for assignments, which enable students to independently gather resources for website development. This approach effectively showcases students' individual thinking space, fosters their interest in learning, and stimulates deep contemplation. Moreover, within a free and relaxed environment, students can fully unleash their imagination, explore knowledge, actualize ideal designs, and relish the sense of accomplishment derived from creation. The task primarily emphasizes the cultivation of higher-order cognitive skills. Naturally, there may arise additional challenges during the process that prompt students to revisit discussion platforms or review videos for further comprehension. Closed-loop online sessions enable unresolved complex issues to be addressed in offline classrooms.

5.3 Discussion Platform in the Course

Many existing online course discussion platforms are limited to teacher posts and student replies, primarily serving as a means of earning points rather than fostering a true community for knowledge creation. Consequently, they fail to ignite students' interest or stimulate their proactive engagement in learning. By incorporating both subjective closed operation questions and subjective open operation questions, this course will effectively stimulate students' intrinsic motivation to learn, thereby fostering their proactive engagement in seeking solutions when faced with challenges. Peer review will serve as a catalyst, fostering motivation and perseverance among participants. Additionally, prompt feedback from both educators and peers will invigorate the discussion platform, enhancing its dynamism. Moreover, the active participation of students through offering diverse solutions, coupled with teachers' systematic synthesis and guidance, can elevate certain posts to a profound level, fostering knowledge creation and establishing the discussion platform as an exceptionally captivating landscape within the online session.

5.4 Application Effect

The design of the self-regulating intervention model for the online component of this course has significantly enhanced students' feedback effect. For instance, one student remarked, "This course provided me with a profound experience of the joy in creating works and introduced me to the fascinating platform for communication that is the discussion board. Here, I am not only acquired substantial knowledge but also received guidance from classmates and teachers. The majority of

posts on the discussion board contain practical information, enabling me to expand my knowledge and develop problem-solving skills. I have experienced significant personal growth throughout this semester." Another student stated, "Unlike other courses that simply impart a fixed amount of knowledge, this course taught me that there are countless unexplored areas waiting to be discovered. The development of computer technology knows no bounds, and numerous problems have been raised on the discussion platform—some even exposing weaknesses in current technology. This realization has instilled in me a sense of responsibility to contribute my best efforts to this field." These testimonials demonstrate how improved self-regulation abilities transform students from passive listeners into active participants who effectively engage in meaningful online learning experiences; they become highly proficient moderators within an online environment and derive greater benefits from networked education than anticipated or compared to traditional educational models.

6. Summary

In the era of "Internet plus," education is confronted with numerous opportunities and challenges. How to effectively seize these prospects and confrontations, elevating teaching to a new level, is a question that every educator should contemplate in this emerging era. This paper proposes a pedagogical intervention model based on self-regulation theory for reforming online connectivity. By incorporating self-regulated learning (SRL) prompts, designing subjective operational questions for online engagement, constructing platforms for peer evaluation and discussion, student-centered online courses are devised to stimulate their interest and enthusiasm towards learning while assisting them in overcoming difficulties and progressively deepening the learning process. Through an interlocking array of measures, the potential of online courses is maximized while simultaneously sowing seeds for offline student participation. In essence, the ultimate goal of education lies in cultivating lifelong learning abilities; thus, this design concept also underpins the integration of online components within hybrid golden courses.

Acknowledgement

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