Effects of Teaching Behaviors on the Effectiveness of Classroom Learning Time

https://doi.org/10.3991/ijet.v17i09.30943

Wei Zhang(✉), Shiyuan Gan, Huagang He, Shengping Zhou
Chongqing Technology and Business Institute, Chongqing Open University, Chongqing, China
zhangwei923@cqtbi.edu.cn

Abstract—Vocational and technical higher education in China has made great progress. However, classroom learning inefficiency is still observed. Based on the composition theory of classroom instructional time and the characteristics of classroom teaching in vocational and technical colleges, evaluation indexes of the effectiveness of classroom learning time were proposed in this study, and the effects of teaching behaviors on the effectiveness of the classroom learning time were analyzed through the observation on teaching behaviors and learning efficiency. Using the classroom teaching of "equivalence calculation in engineering economy" in a vocational and technical college in Chongqing, China as the subject, the classroom observation results were given, while the effects of frequency, cumulative time and the essence of teaching behaviors on the average value of learning time effectiveness (AEV_p) and learning effectiveness per unit time (EV) were analyzed. Results show that the longer the time spent on a teaching behavior, the greater the AEV_p would be, while EV differs, and "questioning"-typed teaching behaviors usually had positive effects on EV. Results indicate that the conversion of reasonable intervals between teaching behaviors helps to improve EV, and arrangement of personalized learning tasks and the strategies of answering questions need to be taken seriously. This study revealed the relationship between teaching behaviors and the effectiveness of classroom learning time, which may provide the evidence for optimizing instructional design and provide a path to fulfill the personalized learning needs.

Keywords—vocational and technical college, teaching behavior, classroom learning time, effectiveness

1 Introduction

Under the background of strong government support, the vocational and technical higher education in China has made great progress in the improvement of teaching environment, teaching methods and teaching techniques. However, a series of specific problems that lead to the inefficiency of classroom learning time for students in vocational and technical colleges are still observed, such as the unreasonable distribution of instructional time, low utilization of instructional time [1], imbalance between reception learning time and self-discovery learning time of students, and great difference in engaged time [2].

As the leading factor of classroom instructional time, teaching behaviors are the external manifestation of the distribution and utilization of instructional time, as well as the direct influencing factor of the effectiveness of students' classroom learning time. However, the current management strategies for classroom teaching behaviors in vocational and technical colleges are mainly based on the two following dimensions: (1) Most of them roughly divide the classroom teaching into paragraphs according to the course content [3] and lack the consideration of the relationship between the components of classroom instructional time. (2) They are mostly proposed from the perspective of "teaching", and less consideration is given to the learners' response to teaching [4-5]. These problems may lead to the extensive management of teaching behaviors in teaching practice. The evaluation of the effectiveness of teaching behaviors is the lack of criteria [6].

To improve the management level of classroom teaching behaviors in vocational and technical colleges, as well as the effectiveness of the students' classroom learning time, this study observed the students' response to teaching behaviors based on the time component of classroom teaching, while methods to evaluate the effectiveness of the students' classroom learning time were proposed, and the effects of teaching behaviors on the effectiveness of students' classroom learning time were also analyzed through a case in vocational and technical colleges.

2 State of the art

The classroom is the main position of education reform, and classroom instruction analysis is an important basis in improving the quality of classroom teaching. As early as the 1970s, the quantitative analysis of classroom instruction had a climax of development [7]. After more than half a century, the important role of classroom instruction analysis has been widely recognized by educational circles. At present, using teaching activities or teaching events as the point of penetration has become a common framework for classroom instruction analyses. For example, Israeli scholars proposed the hexagonal prism framework for classroom observation, which used learning tasks and teaching activities as the objects [8]. The key teaching events analysis [9-10] and classroom episode diagnosis proposed by Chinese scholars used teaching events as the analysis unit.

In terms of classroom learning evaluation, traditional evaluation methods focus on the students' mastery of knowledge and skills [11], while ignoring other quality requirements for their development, including personalized learning needs [12]. In addition, the evaluation of the students' classroom learning efficiency is mostly based on the overall atmosphere and the evaluator's experience in the classroom [13]. The evaluation lacks quantitative evidence support and is highly subjective [14].

The methods of the existing research excessively focus on the feasibility of the application of technical means in classroom instruction analysis, and most of them take teaching activities and teaching tasks as a link to divide and analyze classroom time, which is insufficient in considering the internal relationship between various teaching activities and classroom time segment. The existing evaluation methods mostly analyze

from the perspective of teaching, while insufficient consideration is given to the relationship between the teachers' teaching behaviors and students' learning efficiency.

Based on classroom teaching theories of "time composition theory" and "five-steps instructional method" [2], this study fully considered the organic relationship between teaching activities and classroom time, payed attention to the observation of students' learning behaviors and learning efficiency under teaching behaviors, and proposed the evaluation indexes of the students' classroom learning time effectiveness on this basis, analyzed the effects of teaching behaviors on the effectiveness of students' learning time. This study can provide references for teachers in optimizing classroom instructional design to improve the effectiveness of the students' classroom learning time.

3 Evaluation method of the effects of teaching behaviors on the effectiveness of classroom learning time

3.1 Distribution model of classroom learning time

At present, most engineering technology courses in Chinese vocational and technical colleges adopt synchronous instruction methods. In the synchronous instruction process, due to the individual differences of students, the instruction provided by teachers for all students at the same time can only fulfill the individual learning needs of some students. From the perspective of the composition structure of classroom time, for any specific time period, only a few students with similar learning needs are in the state of highly efficient learning, while most learners are in the state of low efficient learning. For any specific learner, there will only be some discontinuous highly efficient learning periods on the independent learning time axis. The distribution model of the students' individual learning time is shown in Figure 1.

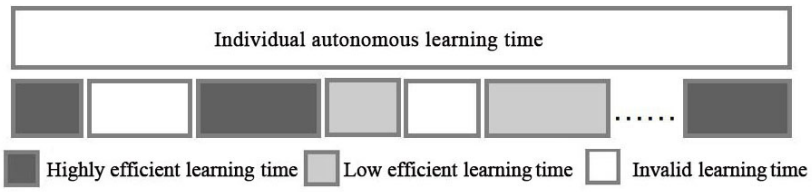

Fig. 1. Schematic diagram of distribution model of classroom learning time

3.2 Evaluation indexes for effectiveness of classroom learning time

Classroom teaching behaviors refer to the activity process, in which teachers and students take effective teaching and learning behaviors and complete teaching/learning tasks with high quality to achieve the specified teaching/learning objectives within the unit classroom time. Any teaching activity is inseparable from two classroom participants: teachers and students, who promote effective instruction jointly. Therefore, the

effectiveness of teachers'/students' behaviors choices and behavioral characteristics [15] may determine the effectiveness of classroom learning time to a certain extent.

This study proposed a series of evaluation indexes for the effectiveness of classroom learning time. By collecting the behavioral characteristics of students in class through classroom instruction analysis, judging the "effectiveness" of classroom learning time according to students' behavioral characteristics, the effective score ev can be given to the length of time t (s) spent on relevant learning behaviors to calculate the effective value of each student's individual classroom learning time, EV_p. Then the average of the effective values of all students in a certain period of classroom learning time (AEV_p) can be calculated, and divided by t to obtain the effectiveness index of the students' learning time in unit time, EV.

EV_p and AEV_p may reflect the effective value of learning time, while EV reflects the average utilization efficiency of students' classroom learning time. The effects of teaching behaviors on the effectiveness of classroom learning time can be judged by EV. The calculation method of evaluation indexes are shown in Equation 1 ~ 3.

$$EV_p = \int_{t_1}^{t_2} ev_h + \int_{t_1}^{t_2} ev_l + \int_{t_1}^{t_2} ev_o \tag{1}$$

$$AEV_p = \frac{\sum_{n=1}^{n} EV_p}{n} \tag{2}$$

$$EV = \frac{AEV_p}{t_2 - t_1} \tag{3}$$

where t_1 and t_2 refer to the time when a classroom learning behavioral characteristic appears and ends, ev_h, ev_l and ev_o may refer to the effective scores corresponding with the "highly efficient", "low efficient" and "invalid" learning time, n represents the number of students observed, t represents the duration of the teaching/learning behaviors observed, $t = t_2 - t_1$.

3.3 Datasheet for students' classroom learning time observation

This study analyzed the typical behavioral characteristics of students in engineering technology courses of a vocational and technical college in Chongqing, China, and formulated the datasheet for the students' classroom learning time observation in combination with the relevant parameters required in Equation 1 ~ 3, as shown in Table 1.

Table 1. Datasheet for the students' classroom learning time observation

Types of behavioral characteristics	**Classroom learning behaviors**		**Length of time 1 (s)**	**Length of time 2 (s)**	**…**	**Length of time m (s)**
	Behavioral characteristics	***Code***				
Behavioral characteristics in invalid learning time (ST0)	Distracted by electronic devices	ST0a				
	Blank	ST0b				
	Whisper to each other	ST0c				
	Fidgeting	ST0d				

Behavioral characteristics in individual low efficient learning time (ST1)	Shallow reading	ST1a				
	Listen but not concentrate	ST1b				
	No response to teacher's questions	ST1c				
	Collective failure to interact with teachers	ST1d				
	Plagiarize from classmates	ST1e				
Behavioral characteristics in individual highly efficient learning time (ST3)	Listen carefully	ST3a				
	Focus on thinking	ST3b				
	Respond positively to questions	ST3c				
	Good interaction with teachers in groups	ST3d				
	Discuss with classmates	ST3e				

In Table 1, $ev = 3$ when students are in "highly efficient" learning time, $ev = 1$ when they are in "low efficient" learning time, and $ev = 0$ when the learning time is "invalid".

3.4 Calculation table for the effects of teaching behaviors on the effectiveness of classroom learning time

The main means to judge the effects of teaching behaviors on the effectiveness of classroom learning time is to observe the students' learning behaviors in class. Based on the typical process of the implementation of classroom teaching behaviors, the "five-steps instruction", this study divided the typical process of the implementation of teaching behaviors into six stages: teaching preparation, learning problem presentation, indication for problem-solving to all students, investigation on the learning situation, instruction for temporary learning problems, and providing materials for reinforcement learning. Then, the typical teaching behaviors included in the six stages were divided into various categories, while the calculation table of student learning time effectiveness corresponding to different teaching behaviors was given, as shown in Table 2.

Table 2. Calculation table for the effects of teaching behaviors on the effectiveness of classroom learning time

Steps of teaching behaviors	**Category of teaching behaviors**	**Effective value of students' classroom learning time**			
		S1	***S2***	**…**	***Sn***
G0 Preparation	G0i Teaching equipment preparation				
	G0ii Teaching materials preparation				
	G0iii Roll call and sign in				
	G0iv Drawing attention				
G1 Presentation	G1i Declarative teaching				

	G1ii Demonstration with examples				
	G1iii Expository teaching				
G2 Indication	G2i Presenting learning objectives, tasks and main points				
	G2 ii Providing students with materials that stimulate vision and hearing				
	G2iii Providing auxiliary materials for memorizing, maintaining and reproducing learning contents				
	G2iv Providing structured materials for deep learning				
	G2v Providing materials for stimulating goal-directed learning motivation, interest and attention				
G3 Questioning	G3i Questioning for memorizing				
	G3 ii Questioning for understanding				
	G3iii Questioning for applying				
	G3iv Questioning for analyzing				
	G3v Comprehensive questioning				
	G3vi Questioning for evaluating				
G4 Investigation	G4i Collective enquiry				
	G4ii Observing collective action				
	G4iii Observing individual action				
	G4iv Listen to students				
G5 Instruction	G5i Individualized instruction and answering question				
	G5ii Group instructing and answering question				
	G5iii Instructing and answering questions on key and difficult problems of the whole class				
G6 Reinforcement	G6i Positive reinforcing				
	G6ii Negative reinforcing				
	G6iii Reinforcing through practice				

3.5 Application of the evaluation method

Through Tables 1 to 2 and Equations 1 to 3, the evaluation indexes of the effectiveness of classroom learning time can be calculated. The calculation results $EV \in [0,3]$, wherein the greater the EV, the higher the average utilization efficiency of students' classroom learning time, and the more efficient the effects of teaching behaviors on the effectiveness of students' classroom learning time, and vice versa.

4 Instruction case analysis

4.1 Selection and investigation of instruction case

This study selected the classroom teaching of "equivalence calculation in engineering economy" in a vocational and technical college in Chongqing, China as the subject. The teaching behaviors in the case classroom was divided and classified into typical teaching behavior categories in Table 2, the utilization of students' learning time under

typical teaching behavior categories was observed and recorded, and the effectiveness parameter of the students' learning time EV_P was calculated. Results are shown in Table 3.

Table 3. EV_P of the classroom instruction

Categories of teaching behaviors	Frequency	Length of time (s)	EV_P							
			S1	*S2*	*S3*	*S4*	*S5*	*S6*	*S7*	EV_P
G0i	0	0	0	0	0	0	0	0	0	0
G0ii	1	10	19	19	28	30	20	7	7	19
G0iii	1	84	199	228	214	251	160	183	160	199
G0iv	1	3	7	8	9	9	7	6	6	7
G1i	3	121	128	356	48	354	224	125	244	211
G1ii	4	69	63	183	67	193	29	0	206	106
G1iii	10	155	0	360	192	430	17	199	257	208
G2i	6	73	98	204	152	218	75	50	36	119
G2ii	0	0	0	0	0	0	0	0	0	0
G2iii	10	154	199	439	453	462	169	148	161	290
G2iv	3	128	130	287	311	385	147	188	221	238
G2v	3	30	0	84	24	90	12	79	82	53
G3i	3	12	30	31	32	33	25	35	29	31
G3ii	2	19	44	57	51	58	32	47	31	46
G3iii	3	15	38	43	45	44	42	35	38	41
G3iv	7	34	60	64	79	79	62	85	98	75
G3v	4	89	261	265	137	157	248	48	246	195
G3vi	0	0	0	0	0	0	0	0	0	0
G4i	14	89	208	194	243	154	199	205	223	204
G4ii	13	276	483	704	787	725	281	18	175	453
G4iii	26	119	352	327	319	188	340	29	226	254
G4iv	6	111	330	334	153	273	281	50	73	214
G5i	17	315	783	785	265	717	521	3	134	458
G5ii	1	208	412	516	506	559	199	242	57	356
G5iii	3	44	71	73	128	83	14	79	131	83
G6i	25	105	161	161	293	309	65	94	257	191
G6ii	4	18	0	46	0	55	0	0	49	21
G6iii	2	119	354	337	214	303	322	0	15	221

4.2 Instruction case study

Analysis of teaching behaviors. In the case classroom, great differences in the time spent on different teaching behaviors were observed. Among them, "G4 Investigation" and "G5 Instruction" occupied more time, accounting for 24.75% and 23.67%, respectively. "G0 Preparation" and "G3 Questioning" took less time, accounting for 4.08% and 7.04%, respectively.

Great differences in the frequency of different teaching behaviors were observed. Among them, "G4 Investigation" and "G6 Reinforcement" are more, accounting for

34.10% and 17.92%, respectively. In this class, teachers did not use two typical teaching behaviors: "G2ii" and "G3vi".

The average duration of each teaching behavior varied, as shown in Figure 2.

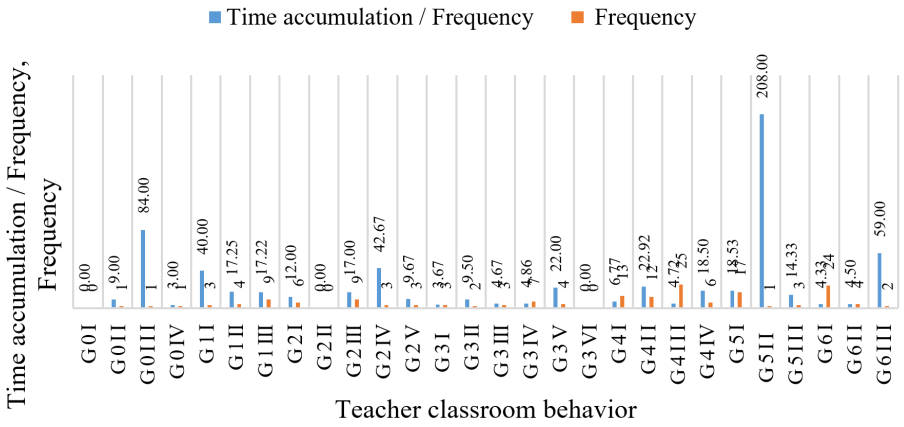

Fig. 2. Frequency and average duration of teaching behaviors

Figure 2 shows that the teaching behaviors with long average duration in a single time mainly included G5ii, G0iii, G6iii, G2iv, and G1i, all of which were not less than 40s, the frequency of these teaching behaviors was less, no more than three times. Most teaching behaviors lasted for a short time, but occurred more frequently.

Effects of teaching behaviors on the effectiveness of classroom learning time

Effects of time accumulation of teaching behaviors on AEV_p. According to the data in Table 3, the more time-consuming the teaching behaviors are, the greater the AEV_p. Comparison between the time accumulation of teaching behaviors and AEV_p would be, as shown in Figure 3.

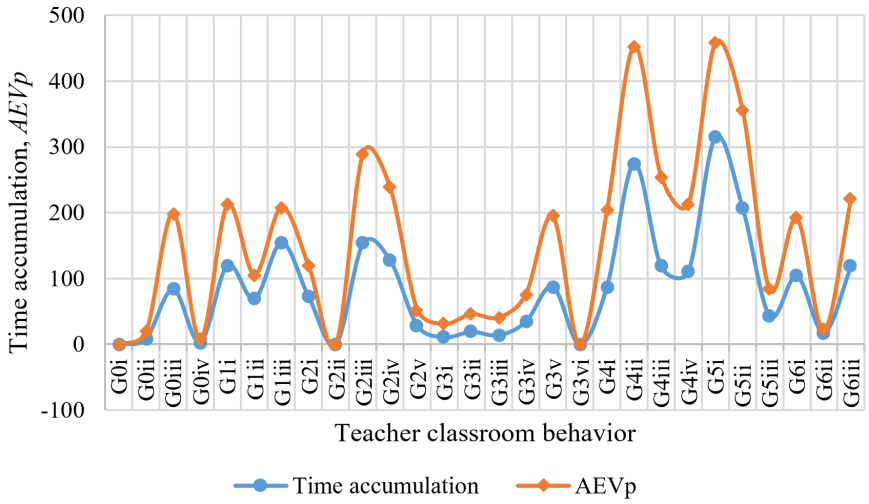

Fig. 3. Comparison between time accumulation of teaching behaviors and AEV_p

Figure 3 shows that the instruction time accumulation spent on G5i, G4ii, G5ii, G1iii, and G2iii is longer, while the AEV_p is relatively larger. The time accumulation of teaching behaviors is positively correlated with AEV_p. However, with the increase in instruction time spent on a single teaching behavior, the increasing speed of AEV_p decreases.

Effects of time accumulation of teaching behaviors on EV. As a teacher spends more time on a teaching behavior, AEV_p increases accordingly. However, differences in EV were observed, which reflects that each teaching behavior has different effects on the students' utilization efficiency of classroom learning time. In this study, the EV under each teaching behavior was calculated, while the comparison between time accumulation of teaching behaviors and EV was given, as shown in Figure 4. No significant correlation between time accumulation of teaching behaviors and EV was observed.

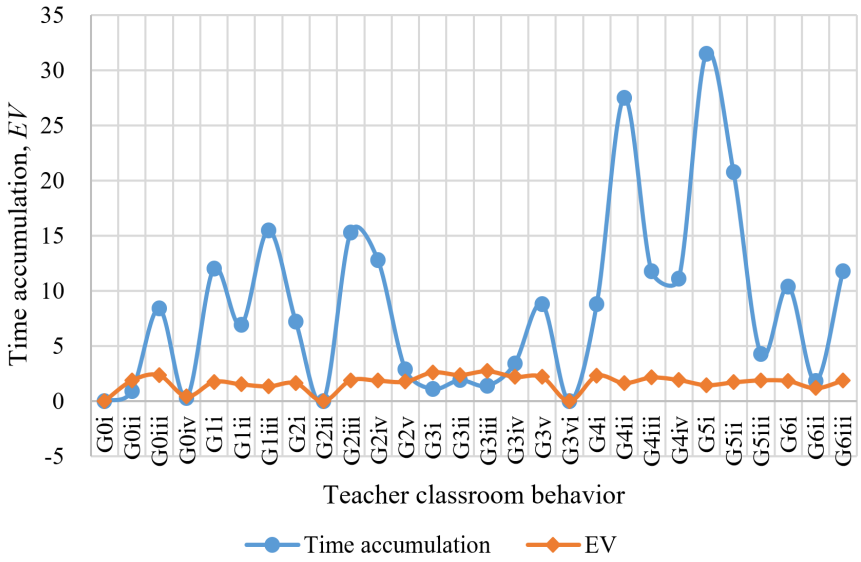

Fig. 4. Comparison between time accumulation of teaching behaviors and *EV*

Effects of teaching behavioral frequency. Through analysis, the frequency of teaching behaviors has no significant correlation with AEV_p and EV. However, according to classroom observation, the conversion with reasonable intervals between different teaching behaviors helps in improving the effectiveness of the students' classroom learning time to a certain extent.

Effects of the essence of teaching behaviors. Through the analysis above, the most influential factor on the effectiveness of classroom learning time is the essence of teaching behaviors. The change of EV under each typical teaching behavior is shown in Figure 5.

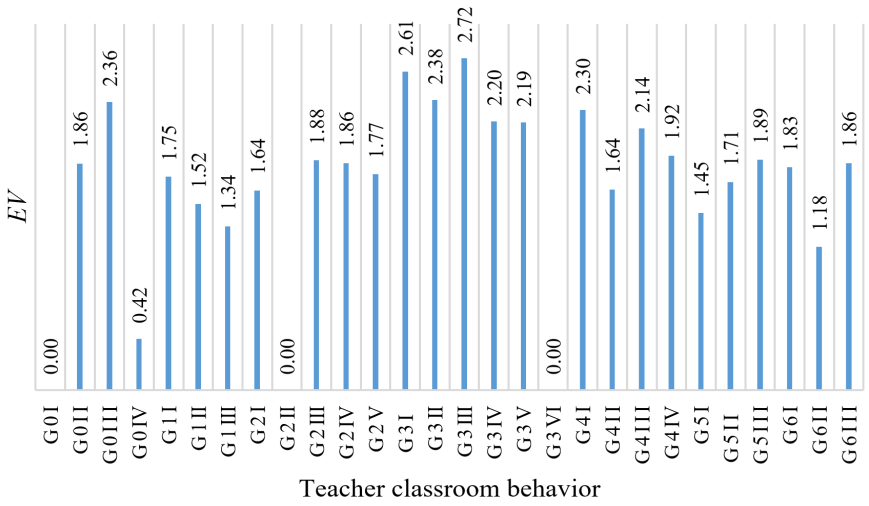

Fig. 5. *EV* corresponding to classroom teaching behaviors

Figure 5 shows that the *EV* under typical teaching behaviors of questioning type is relatively high, but in the case classroom, the typical teaching behaviors of "G3vi Questioning for evaluating" were not used, which is a loss to improve the effectiveness of classroom learning time. Pre-class instructional design and mutual exchange of teaching experience may be effective ways to improve this problem.

The teaching behaviors of "G5 Instruction" should have a higher *EV* due to strong interaction [16-17], but it was lower in the case classroom. Through classroom observation, two main reasons for the lower *EV* values in the two links of "G5i Individualized instructing and answering question" and "G5ii Group instructing and answering question" were observed: First, the learning tasks assigned by teachers failed to attract enough attention of students, resulting in low enthusiasm for learning, Second, the students' self-discipline was insufficient, and they were in a highly efficient learning state only when they were the object of individual instruction. The underlying cause is that the teacher failed to assign pre-class learning tasks according to the teaching content and learning situation and failed to individualize the instructional design before class.

Under the behaviors of "G5iii Instructing and answering questions on key and difficult problems of the whole class", the reasons for lower *EV* value are as follows: After assigning tasks to all students, the teacher then conducted the teaching behaviors of "G5i Individualized instructing and answering question" to some students, which solved the learning problems of the students (such as S2, S4), while in the link of G5iii, the learning efficiency of these students was lower, Students (such as S3, S7) who were relatively inefficient in "G1 Presentation" and "G2 Indication" had higher learning efficiency in G5iii.

5 Conclusions

To analyze the effects of teaching behaviors on the effectiveness of the students' classroom learning time, this study observed the teaching behaviors and students' learning efficiency in case classroom. The following conclusions could be drawn:

1. The longer the time spent on a teaching behavior, the greater the AEV_p would be. However, with the increase in instruction time spent on a single teaching behavior, the increasing speed of AEV_p decreases. Teachers should pay attention to the conversion of reasonable intervals between teaching behaviors to improve the effectiveness of the students' classroom learning time.
2. The essence of teaching behaviors has the greatest effects on the effectiveness of classroom learning time. In the classroom teaching behaviors of engineering technology courses, "questioning"-typed teaching behaviors can usually have positive effects on the effectiveness of students' classroom learning time, which should be used more often in teaching practice.
3. The "Instruction"-typed teaching behaviors has good interaction. However, the advantage cannot be brought into full play in the classroom of vocational and technical colleges. Teachers should sufficiently consider the arrangement of personalized learning tasks and the strategies of answering questions in the pre-class instructional design, which has great significance to the overall and extensively improvement of the effectiveness of the students' classroom learning time.

This study took the classroom teaching of an engineering technology course in vocational and technical colleges as the subject. However, differences in courses, teachers, and learning situations were observed, compared with the effects of teaching behaviors in various classrooms on the effectiveness of students' classroom learning time, making the research results more universal and proposing improved constructive strategies for classroom teaching behaviors should be the follow-up study.

6 Acknowledgment

This work was supported by the Higher Education Teaching Reform Research Program of Chongqing Municipal Education Commission, China (Grant No. 202637 & 193458).

7 References

[1] Zhi, D. H. (2012). Effective classroom teaching time management strategy. Chongqing, China: Southwest University. http://doi.org/10.7666/d.y2085626

[2] Chen, Y. B. (2006). Instructional-time perspective and technological support of effective instruction in classroom. Shanghai, China: East China Normal University. http://doi.org/10.7666/d.y895821

[3] Zheng, Y. L. (2020). Teaching design and practice of flipped classroom from the perspective of ARCS Model. Modern Distance Education, 42(3), pp. 18-23. http://doi.org/10.3969/j.issn.1001-8700.2020.03.003
[4] Zhang, F. F. (2021). Construction and application of the analysis model of student's learning behavior in the blended teaching mode. Huangshi, Hubei, China: Hubei Normal University. http://doi.org/10.27796/d.cnki.ghbsf.2021.000128
[5] Yang, P., Lai, S., Guan, H., and Wang, J. (2022). Teaching Reform and Practice Using the Concept of Outcome-Based Education: A Case Study on Curriculum Design for a Microcontroller Unit Course. International Journal of Emerging Technologies in Learning (iJET), 17(03), pp. 68-82. https://doi.org/10.3991/ijet.v17i03.29041
[6] Wei, H. J., and Ren, Y. S. (2021). Diagnostic dimension of teaching behavior's effectiveness: the limitations of Flanders interaction analysis system. Journal of Henan University (Social Sciences), 61(04), pp. 130-137. http://doi.org/10.15991/j.cnki.411028.2021.04.019
[7] Sun, Z., Lv, K. Y., Luo, L. M., Chen, M. L., Xu, L., and Shi, Z. P. (2020). Classroom teaching analysis based on artificial intelligence. China Educational Technology, 41(10), pp. 15-23. http://doi.org/10.3969/j.issn.1006-9860.2020.10.003
[8] Zhang, Q. Q., and Tan, L. (2019). Discussing on classroom video in teacher professional development: frameworks, application and implications. Global Education, 48(1), pp. 103-112. http://doi.org/10.3969/j.issn.1009-9670.2019.01.007
[9] Sun, Z., and Ma, Y. H. (2013). Research on promoting novice teachers' professional development by video case multivariate analysis. E-education Research, 34(8), pp. 104-109. http://doi.org/10.13811/j.cnki.eer.2013.08.017
[10] Yu, X. H., and Huang, Q. (2018). Study of Interaction Optimization in Digital Classroom from a Perspective of Learning Analytics. China Educational Technology, 39(2), pp. 12-20. http://doi.org/10.3969/j.issn.1006-9860.2018.02.003
[11] Ifenthaler, D., and Yau, J.Y.-K. (2020). Reflections on Different Learning Analytics Indicators for Supporting Study Success. International Journal of Learning Analytics and Artificial Intelligence for Education (iJAI), 2(2), pp. 4-23. https://doi.org/10.3991/ijai.v2i2.15639
[12] Maynard, C., Garcia, J., Lucietto, A., Hutzel, W., and Newell, B. A. (2021). Experiential Learning in the Energy Based Classroom. International Journal of Engineering Pedagogy (iJEP), 11(6), pp. 4-26. https://doi.org/10.3991/ijep.v11i6.16539
[13] Wu, L. B., Cao, Y. N., and Cao, Y. M. (2021). Reform and practical paths of classroom teaching evaluation under artificial intelligence. China Educational Technology, 42(5), pp. 94-101. http://doi.org/10.3969/j.issn.1006-9860.2021.05.013
[14] Yang, Q. (2021). School classroom teaching evaluation: value judgment, excavation and promotion. Educational Science Research, 32(11), pp. 61-65. http://doi.org/10.3969/j.issn.1009-718X.2021.11.010
[15] Xu, M. J., and Cao, P. Y. (2016). How to analyze the learning situation based on students' difference. Curriculum, Teaching Material and Method, 36(6), pp. 62-67. http:/doi.org/10.19877/j.cnki.kcjcjf.2016.06.010
[16] Sweller, J. (2016). Working memory, long-term memory, and instructional design. Journal of Applied Research in Memory and Cognition, 5(4), pp. 360-367. https://doi.org/10.1016/j.jarmac.2015.12.002
[17] Carcea, I., and Froemke, R. C. (2019). Biological mechanisms for observational learning. Current Opinion in Neurobiology, 54(1), pp. 15-23. https://doi.org/10.1016/j.conb.2018.11.008

8 Authors

Wei Zhang, Doctor's degree, is an associate professor in Chongqing Technology and Business Institute, Chongqing Open University. His research interests focus on differentiated teaching. (email: zhangwei923@cqtbi.edu.cn).

Shiyuan Gan, Master's degree, is an associate professor in Chongqing Technology and Business Institute, Chongqing Open University. Her research interests focus on differentiated teaching.

Huagang He, Master's degree, is a lecturer in Chongqing Open University. His research interests focus on evaluation of teaching.

Shengping Zhou, Master's degree, is a lecturer in Chongqing Open University. His research interests focus on evaluation of teaching.

Article submitted 2022-02-16. Resubmitted 2022-03-20. Final acceptance 2022-03-23. Final version published as submitted by the authors.