ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202608_9(8).0014

Accountability and Learner Identity Cues in Video-Based Learning: Effects on Achievement, Motivation, and Satisfaction

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Abstract

The effectiveness of video-based learning depends on instructional design features as well as on learners' psychological states and the situational cues present during learning. This study examined whether accountability and learner identity cues affect learning achievement, motivation, and satisfaction in an online video-based learning task. We randomly assigned 120 participants to four experimental conditions, using a 2 (accountability: high, low) × 2 (learner identity: high, low) between-subjects design, so that each condition had exactly 30 participants. During the experiment, the participants watched a five-minute teaching video about Erikson's personality development stage. After watching the video, we asked them to complete the measurement of learning achievement, learning motivation, learning satisfaction and accountability perception. The test of accountability manipulation showed that this manipulation was successful. From the results, the independent variable of accountability had a significant main effect on the three outcome variables of learning achievement, learning motivation and learning satisfaction. The score under the condition of high accountability was significantly higher than that under the condition of low accountability. The main effect of learner identity did not reach a significant level on any of the outcome indicators. The interaction between accountability and learner identity had a significant impact on learning motivation and learning satisfaction, but had no significant effect on learning achievement. We further conducted a simple effects analysis on learning satisfaction, and found that under different accountability conditions, the effect of learner identity was not the same. Overall, these findings highlight accountability as a useful cue to support short video-based learning; at the same time, it can also be seen that learner identity cues work differently depending on the specific situation, and its effect is mainly produced in the process of interaction with accountability.

Keywords

Accountability; learner identity; video-based learning; learning achievement; learning motivation; learning satisfaction.

1. Introduction

With the popularity of digital technology in the field of education, online learning has been fully developed, and instructional video is one of its most common forms. The reason why video-based learning is valued is that it can flexibly and massively deliver structured content. Up to now, more and more work has been done to sort out the design factors that will affect the learning effect of instructional video, such as visual presentation, teacher presence, gestures, gaze, subtitles, and learner strategies. From these studies, it can be seen that how the video-based learning results will be, to a large extent, depends on how the video is designed and how the learner interacts with the video.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202608_9(8).0014

In addition to these design features, some psychological factors on the learner will also shape the video-based learning results. One of the factors is accountability, which refers to a state in which learners feel responsible for their own learning behavior, learning performance, or the consequences of their own responses. Previous studies have linked students' judgment of responsibility with learning motivation and achievement [9]. In addition, some studies on decision-making have successfully induced accountability by telling participants that they might need to defend their choices or explain their decisions. In video-based learning, accountability cues are likely to encourage learners to participate more carefully, to process information more thoroughly, and to take learning tasks more seriously.

The second factor is learner identity, which refers to the degree to which individuals can perceive and recognize themselves as a learner and give meaning to their learning activities [12,13]. From the study of identity, we can see how people understand themselves in a given situation will shape their intentions, participation and behavior [14-16]. In a video-based learning environment, cues that highlight the learner's identity may affect how the learner completes the task, especially when the learning situation is defined as meaningful or evaluative.

Although these two constructs have their rationality, we know little about whether and how accountability cues and learner identity cues can jointly shape learning in instructional videos. Existing video-based learning research focuses more on instructional design features and learning strategies, rather than on situational cues that activate responsibility or highlight learner identity. In order to make up for this deficiency, our experiment manipulated the two cues of accountability and learner identity in an online video-based learning task, and measured their effects on learning achievement, motivation and satisfaction.

2. Literature Review and Hypotheses

2.1. Accountability in Learning Contexts

The accountability we say here, in the educational context, refers to the individual being asked to explain and defend their own learning behavior and results, or to an expectation that 'I am responsible for this'. Like some beliefs about responsibility, it is related to students' motivation and learning achievement [9]. When learners feel that their performance needs to be responded to and explained, they are likely to invest more cognitive effort in the task and participate more seriously in the teaching materials. In this study, accountability was not treated as a stable personality tendency, but was manipulated into an experimentally induced state — a temporary feeling that needed to be responded to and accounted for.

Previous work has shown that accountability can be induced in experiments with short instructional cues, such as telling participants directly that they need to explain or prove their reaction [10,11]. This approach is very appropriate in video-based learning research because it allows researchers to separate temporary accountability cues to see what impact they have on immediate learning outcomes. On this basis, we expect that learners under high accountability conditions will perform better than those under low accountability conditions.

2.2. Learner Identity and Video-Based Learning

Learner identity, which refers to the way in which an individual understands himself as a learner and connects his learning experience with his sense of self. [12,13] Learner identity refers to the way in which an individual understands himself as a learner. Although identity is often seen as a relatively stable thing, it can also be shaped through situational clues and teaching frameworks. When individuals are reminded of their identity as learners, especially in situations where learning is tied to assessment or future performance, they are likely to adopt task-oriented learning behaviors.

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From some of the existing research on identity and learning, identity may be associated with learning satisfaction, sense of meaning, engagement, etc. [15,16]. However, the strength of the learner's identity cues is likely to depend on the specific population and context. For example, the students in the university have already had a relatively clear learner identity, which may make the short teaching prompts less distinguishable. Therefore, whether learner identity cues will produce measurable effects in video-based learning has become an empirical question to be answered in this study.

2.3. Joint Effects of Accountability and Learner Identity

The two factors of accountability and learner identity are likely to interact with each other, because they each shape how learners understand their role in learning tasks. When learners not only have a accountability for their own performance, but also recognize their role as learners, the learning situation will make them feel more meaningful. In this way, participation may be magnified. Conversely, if the learner's identity is prompted without accompanying accountability, it is likely to create a mismatch between the role expectation and the perceived stakes of the task. Therefore, this study not only examines the main effects of accountability and learner identity, but also examines the interaction between them.

Based on these considerations, we propose the following hypothesis:

H1: Participants under high accountability conditions have higher learning achievement, learning motivation and learning satisfaction than those under low accountability conditions.

H2: Under the condition of high learner identity, their learning achievement, learning motivation and learning satisfaction are higher than those under the condition of low learner identity.

H3: There is an interaction between accountability and learner identity in predicting learning achievement, learning motivation and learning satisfaction.

3. Method

3.1. Participants

Finally, the samples entered the analysis, including 120 effective participants recruited through the network platform. There were 59 men and 61 women in the sample, with an average age of 21 years. Participation was voluntary. The participants were randomly assigned to one of the four experimental conditions, and 30 participants were assigned to each condition.

3.2. Design

In this study, we use a 2 × 2 between-subject factorial design. The two independent variables are accountability (high and low) and learner identity (high and low). There are three dependent variables to be seen, namely, learning achievement, learning motivation and learning satisfaction. The manipulation of these two independent variables is completed through the teaching clues presented before the video-based learning task begins, and the participants under different conditions will see different instructions.

3.3. Materials and Measures

The learning material is a five-minute teaching video, which is about Erikson's theory of personality development stage, and the same video is used under all conditions.

The accountability scale was adapted from the version of Mero et al. [11] and revised by He [17]. The scale has a total of 5 items with a 5-point scale, where the higher the score, the greater the perceived accountability. In order to make the topic fit the video-based learning task, we made some adjustments to the wording of the project. For example, a project that originally

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202608_9(8).0014

explained the evaluation results was changed to explain the response results. The internal consistency coefficient α of the scale in this study is .66.

The learning achievement test is developed according to the video content. There are 10 multiple-choice questions in it, and there is only one correct answer for each question. The correct answer is 5 points, and the wrong answer is 0 points. The main test is the retention of video content. The result of the pre-test was that the internal consistency coefficient α was .72, the item difficulty was .49, and the discrimination was .56.

The Learning Motivation Questionnaire was adapted from the tool of Lin et al. [18] to assess the intrinsic motivation of learners in the video-based learning process from the four dimensions of interest, ability, value and pressure. Each dimension has 3 items, a total of 12 items, with a 7-point scale, from 1 point (strongly disagree) to 7 points (strongly agree), in which the pressure dimension items are reverse-scored. The internal consistency coefficient α of the scale in this study was .72.

The measurement of learning satisfaction is based on the questionnaire developed by Wang [19] and the version adapted by Yang [4], covering 17 items such as teacher guidance, course content, teacher-student interaction, learning environment and equipment. The questionnaire uses a 5-point scale, where the higher the score, the higher the satisfaction with the video course. The internal consistency coefficient α of this part of the scale reached .86.

3.4. Experimental Manipulations

The two independent variables of accountability and learner identity were manipulated by the teaching cues given before the start of the video-based learning task.

Under the condition of high accountability, participants were told that after completing the task, they needed to explain their reaction process and why they answered this way. Under low-accountability conditions, participants were told that their answers would be kept secret and used only for research purposes, and that no one would question them.

In the manipulation of learner identity, participants with high learner identity were asked to imagine themselves as a student preparing for the upcoming exam, and the video content was related to the exam. Participants with low learner identity were described as independent learners, and the test results were also set to be non-evaluative. These cues were designed so that different learner identity backgrounds can be highlighted in video-based learning tasks.

3.5. Procedure

The experiment was completed online through the questionnaire platform. Participants were randomly assigned to one of four conditions: high accountability / high learner identity, high accountability / low learner identity, low accountability / high learner identity, and low accountability / low learner identity. At the beginning of the experiment, the participants first received the teaching clues corresponding to their own conditions, and then watched the five-minute teaching video. After watching it, they were required to complete the learning achievement test, learning motivation questionnaire, learning satisfaction questionnaire, and accountability scale.

3.6. Ethical Considerations

The participants who participated in this experiment were all voluntarily enrolled. They were told before they started that all responses would be processed anonymously, and that the data collected would be used only for academic research and would not be used for other purposes.

3.7. Data Analysis

Separate 2 × 2 between-subjects analyses of variance (ANOVAs) were conducted for learning achievement, learning motivation, and learning satisfaction, with accountability and learner identity as independent variables. An independent-samples *t*-test was used to examine the

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202608_9(8).0014

accountability manipulation; because the homogeneity of variance assumption was not met, the Welch result is reported for the manipulation check. All statistical results are reported in APA style.

4. Results

4.1. Accountability Manipulation Check and Descriptive Statistics

The final dataset included 120 valid participants, with 30 participants assigned to each experimental condition. The accountability manipulation was assessed using the accountability scale. Because the homogeneity of variance assumption was not met, the Welch result is reported. Participants in the high-accountability condition reported higher accountability scores (M = 20.58, SD = 1.53) than those in the low-accountability condition (M = 16.05, SD = 2.31), $t(102.51) = 12.67$, $p < .001$. This result indicates that the accountability manipulation was successful.

Descriptive statistics for learning achievement, learning motivation, and learning satisfaction across the four experimental conditions are presented in Table 1.

Table 1. Descriptive Statistics for Learning Achievement, Learning Motivation, and Learning Satisfaction by Experimental Condition

Accountability	**Learner Identity**	Learning Achievement $M \pm SD$	Learning Motivation $M \pm SD$	Learning Satisfaction $M \pm SD$
High	High	45.17 ± 7.37 (n = 30)	64.90 ± 6.47 (n = 30)	76.43 ± 5.67 (n = 30)
High	Low	44.17 ± 5.74 (n = 30)	62.37 ± 5.88 (n = 30)	73.77 ± 3.49 (n = 30)
Low	High	29.50 ± 9.77 (n = 30)	57.20 ± 7.31 (n = 30)	69.93 ± 6.45 (n = 30)
Low	Low	32.00 ± 9.06 (n = 30)	60.50 ± 6.50 (n = 30)	72.87 ± 6.04 (n = 30)

Note. Values are reported as mean ± standard deviation.

4.2. Learning Achievement

A 2 × 2 between-subjects ANOVA was conducted with accountability and learner identity as independent variables and learning achievement as the dependent variable. The main effect of accountability was significant, $F(1, 116) = 87.81$, $p < .001$, $\eta p^2 = .431$, with participants in the high-accountability condition obtaining higher scores than those in the low-accountability condition. The main effect of learner identity was not significant, $F(1, 116) = 0.26$, $p = .620$, $\eta p^2 = .002$. The accountability × learner identity interaction was also not significant, $F(1, 116) = 1.39$, $p = .240$, $\eta p^2 = .012$. The results are shown in Table 2.

Table 2. Analysis of Variance for Learning Achievement

Effect	**df**	F	p	η_p^2
Accountability	1, 116	87.81	< .001	.431
Learner identity	1, 116	0.26	.620	.002
Accountability × Learner identity	1, 116	1.39	.240	.012

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4.3. Learning Motivation

A 2 × 2 between-subjects ANOVA was conducted with accountability and learner identity as independent variables and learning motivation as the dependent variable. The main effect of accountability was significant, $F(1, 116) = 15.96$, $p < .001$, $\eta p^2 = .121$, with participants in the high-accountability condition reporting higher learning motivation than those in the low-accountability condition. The main effect of learner identity was not significant, $F(1, 116) = 0.10$, $p = .750$, $\eta p^2 = .001$.

The accountability × learner identity interaction was significant, $F(1, 116) = 5.93$, $p = .016$, $\eta p^2 = .049$. Inspection of the descriptive means in Table 1 suggests that, under high accountability, participants with high learner identity reported higher learning motivation than those with low learner identity, whereas under low accountability, participants with high learner identity reported lower learning motivation than those with low learner identity. The results are shown in Table 3.

Table 3. Analysis of Variance for Learning Motivation

Effect	df	*F*	*p*	η_p^2
Accountability	1, 116	15.96	< .001	.121
Learner identity	1, 116	0.10	.750	.001
Accountability × Learner identity	1, 116	5.93	.016	.049

4.4. Learning Satisfaction

A 2 × 2 between-subjects ANOVA was conducted with accountability and learner identity as independent variables and learning satisfaction as the dependent variable. The main effect of accountability was significant, $F(1, 116) = 13.41$, $p < .001$, $\eta p^2 = .104$, with participants in the high-accountability condition reporting higher learning satisfaction than those in the low-accountability condition. The main effect of learner identity was not significant, $F(1, 116) = 0.02$, $p = .895$, $\eta p^2 < .001$. The accountability × learner identity interaction was significant, $F(1, 116) = 7.68$, $p = .007$, $\eta p^2 = .062$. The results are shown in Table 4.

Table 4. Analysis of Variance for Learning Satisfaction

Effect	df	*F*	*p*	η_p^2
Accountability	1, 116	13.41	< .001	.104
Learner identity	1, 116	0.02	.895	< .001
Accountability × Learner identity	1, 116	7.68	.007	.062

Because the interaction effect on learning satisfaction was significant, simple effects were examined. Under the high-accountability condition, the difference in learning satisfaction between the high and low learner-identity groups was not significant, $F(1, 116) = 3.48$, $p = .065$, $\eta p^2 = .029$. Under the low-accountability condition, the high learner-identity group reported significantly lower learning satisfaction than the low learner-identity group, $F(1, 116) = 4.22$, $p = .042$, $\eta p^2 = .035$. Within the high learner-identity condition, participants in the high-accountability group reported significantly higher learning satisfaction than those in the low-

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202608_9(8).0014

accountability group, $F(1, 116) = 20.70$, $p < .001$, $\eta p^2 = .151$. Within the low learner-identity condition, the difference between the high- and low-accountability groups was not significant, $F(1, 116) = 0.40$, $p = .530$, $\eta p^2 = .003$. The simple effects results are shown in Table 5.

Table 5. Simple Effects Analysis for Learning Satisfaction

Simple effect comparison	df	*F*	*p*	η_p^2
High accountability: high vs. low learner identity	1, 116	3.48	.065	.029
Low accountability: high vs. low learner identity	1, 116	4.22	.042	.035
High learner identity: high vs. low accountability	1, 116	20.70	< .001	.151
Low learner identity: high vs. low accountability	1, 116	0.40	.530	.003

Note. Simple effects are reported for learning satisfaction only.

5. Discussion

A central finding of our experiment was that a very brief accountability manipulation — just telling learners directly that they need to explain their reactions — had a consistent, moderately large effect on learning achievement, learning motivation, and learning satisfaction. Learner identity cues did not show significant main effects on the three outcome indicators. However, there was indeed an interaction between these two factors in learning motivation and learning satisfaction (there was no such interaction effect on learning achievement). This also shows that how much effect the learner's identity cues can play depends to a certain extent on the level of accountability.

This robust accountability effect can be matched with the following point of view: when learners foresee in advance that they will be asked to explain the response and take responsibility, they will allocate more cognitive effort to the learning task. This explanation is also consistent with the existing evidence. Previous studies have found that accountability cues can induce a state of high accountability in the experiment [10,11], and those beliefs related to responsibility are also related to motivation and achievement in the educational environment [9]. Our research takes this piece of work one step further, demonstrating that even just giving a minimal accountability cue before a short instructional video is played in this experimental setting is enough to improve learning achievement, motivation, and satisfaction.

In this experiment, the main effect of learner identity did not reach a significant level. There are two possible explanations for this result. One explanation is that college students themselves already have a fairly stable learner identity, so what a brief situational cue can add to their existing baseline self-perception may really not be much. There is also a possibility that the manipulation of learner identity does not directly drive the results, but plays a role of a moderating factor. How much influence it has depends on whether there are other cues present-this explanation can be matched with the significant interaction between learning motivation and learning satisfaction we observed. These results do not mean that learner identity has nothing to do with video-based learning, but show that identity cues work in a context-dependent manner. Only when it is put together with other situational factors (such as accountability) can its effect be more easily perceived.

The results of the interaction also provide some support for this explanation. In terms of learning achievement, there is no interaction between accountability and learner identity,

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202608_9(8).0014

which indicates that the impact of accountability on learning achievement is consistent regardless of the learner identity condition. When it comes to the index of learning motivation, the interaction is significant. From the descriptive data pattern, it can be seen that under the condition of high accountability, participants with high learner identity will report higher learning motivation than participants with low learner identity; but under the condition of low accountability, this pattern is reversed. However, because this study did not further test the simple effect of learning motivation, the descriptive model seen here needs to be tested in future work.

For learning satisfaction, we found a significant interaction and further tested it with simple effects analysis. Specifically, under the condition of high accountability, the difference between the two groups of high learner identity and low learner identity did not reach a significant level (p = .065). However, under the condition of low accountability, the situation was different: the satisfaction of the high learner identity group was significantly lower than that of the low learner identity group. In addition, under the condition of high learner identity, the satisfaction of high-accountability participants was significantly higher than that of low-accountability participants; however, under the condition of low learner identity, the difference brought by the level of accountability was not significant.

These findings allow us to see that the influence of learners' identity cues on subjective experience will change with different accountability situations. Here's one thing that deserves special attention: prompting learner identity in the absence of accountability is associated with lower levels of satisfaction — a model that emphasizes just how important it is to consider these two factors together.

5.1. Future Research Directions

From the results of this study, there are still several directions worth exploring in the future. The first direction is that future research can also include direct measurements of learners' identity perception to see how these cues strongly shape learners' self-perception in video-based learning. Secondly, if there is a study that combines online learning tasks with some behavioral indicators (such as checking logs, attention checks, or eye tracking), it will provide a richer explanation of how accountability and identity cues affect learner engagement. In addition, extending this experimental design to a wider group of learners — such as adult learners, trainees in the workplace, or participants in an informal learning environment — while also experimenting with different types of instructional videos, such as longer courses, procedural content, or skill-based content, will help build the replicability of the findings. Furthermore, the subsequent psychometric work can also take a step forward to refine the measurement tools of accountability and learning motivation in video-based learning situations. Finally, it may not be enough to rely on the immediate retention test. If we can add some migration items, delayed post-test, or measurement of learning behavior on the basis of it, we can reflect the learning effect more comprehensively.

6. Conclusion

Through this experiment, we can see that in short video-based learning, a very simple accountability cue — that is, to prepare learners to explain their reactions — can bring up learning achievement, learning motivation and satisfaction. Learners' identity cues do not show a direct main effect, but they interacts with accountability in learning motivation and satisfaction, which indicates that identity cues will play a role in a context-dependent manner, mainly when combined with task accountability. These findings help us to understand how situational cues shape video-based learning, and also emphasize accountability. It is a practical, low-cost strategy that can be used to support short instructional video-based learning. Future research can also extend this design to a wider group of learners, using different types of

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202608_9(8).0014

teaching content, and can also combine this design with other measurement indicators of learning, so that the conditions for accountability and learner identity cues can be described more clearly.

Acknowledgements

The author thanks the participants for their time and cooperation.

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