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Which Motivational Factors Predict Pre-Service Teachers' Evidence-Informed Reasoning When Being Confronted With Teaching Problems?

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Abstract: Teachers are typically confronted with various classroom-related challenges every day (e.g., students might have difficulties understanding new concepts). However, they rarely reason about such challenges in an evidence-informed manner. Based on the theory of planned behavior, we examined what motivational prerequisites might facilitate pre-service teachers' engagement in evidence-informed reasoning about classroom-related challenges. $N = 157$ pre-service teachers were asked about their motivation to engage in evidence-informed reasoning and analyzed case scenarios of problematic teaching situations in an online learning environment. Structural equation modeling indicated that attainment value, descriptive normative beliefs, and self-efficacy were important prerequisites for the formation of intentions to engage in evidence-informed reasoning and the subjectively perceived behavior in order to solve classroom-related challenges. The findings suggest to help pre-service teachers carefully reflect and discuss what is part of the teacher role and their identification with this role.

Problem statement

Every day, teachers are confronted with various classroom-related challenges (e.g., students might not be motivated to learn, might not understand subject-matter information, etc). In these cases, teachers must decide how to react to these problems. In their decision-making, they are supposed to take scientific theories and evidence into account (e.g., Bauer & Prenzel, 2012). However, teachers rarely use scientific knowledge for teaching-related decisions (Dagenais et al., 2012; Demski, 2018), even though it is believed to improve the quality of their teaching. König et al. (2014) found that having pedagogical knowledge available is associated with the quality of teachers' interpretation of classroom situations. The rare use of scientific knowledge has also been demonstrated for pre-service teachers who are still in teacher training (e.g., Csanadi et al., 2020).

Among the various reasons for the inadequate use of scientific evidence (see below), we suspect motivational aspects to play an important role, especially for pre-service teachers. Thus, the main research question of the present study is: Which motivational characteristics predict pre-service teachers' engagement in evidence-informed reasoning when being confronted with classroom-related challenges?

Barriers to evidence-informed reasoning

When teachers are confronted with classroom-related challenges, scientific evidence, i.e., especially theories from educational and psychological science and corresponding empirical findings, can help to find effective solutions. However, the function of this scientific evidence is not to dictate what a practitioner should do in a specific situation, but to help to prepare for, to justify and to correct educational actions (Neuweg, 2007). Thus, we use the term evidence-informed reasoning for this kind of behavior throughout the rest of this article.

Though considered helpful, empirical evidence shows that teachers rarely apply evidence-informed reasoning when being confronted with classroom-related challenges (e.g., Dagenais et al., 2012; Demski, 2018). The literature offers a variety of reasons: Among them are limited resources (e.g., time constraints, lack of availability of scientific evidence, or lack of external support) or personal factors (e.g., ability deficits in the use of scientific knowledge, or unfavorable attitudes toward scientific theories, see Dagenais et al., 2012). In a comprehensive empirical investigation of reasons for using research-based information in teaching practice, Lysenko et al. (2014) differentiate four factors that predict the use of research-based information by teaching professionals: (a) awareness activities, i.e., being in contact with research and its application potential, (b) organizational factors, i.e., an organizational environment that supports engagement with research-based information by providing resources and structures, (c) opinions about research, i.e., thinking that research is useful and usable, and (d) individual expertise, i.e., individual skills in interpreting and using research-based information. The external factors (a and b) might be particularly relevant for in-service teachers. However, for pre-service

teachers, universities should provide extensive awareness for research-based information and organizational structures and resources ideal to engage with research. In contrast, individual factors (c and d) might be relevant already in teacher education. Lysenko et al. (2014) showed that the motivational factor "opinions" (c) predicted the largest amount of variance regarding the use of research-based information. Further, pre-service teachers' abilities (d) are to be built yet and cannot be presupposed. Therefore, within these internal factors, particularly motivational factors might be crucial in understanding why pre-service teachers use scientific evidence to tackle classroom-related challenges or not.

Theory of planned behavior and evidence-informed reasoning

To conceptualize pre-service teachers' motivation to engage in evidence-informed reasoning, we use the theory of planned behavior (Fishbein & Ajzen, 2010) in the present study because the behavior that is to be predicted can be considered planned behavior. Evidence for this comes from a study by König et al. (2014), who investigated teachers' pedagogical analyses of classroom situations presented in video vignettes. They found that the quality of interpretations of these situations is strongly associated with available declarative and explicit pedagogical knowledge. Hence, the authors argued that interpreting classroom situations is a deliberate, effortful process that requires motivation, which should be especially true for beginning teachers. In addition, the theory of planned behavior is well suited to integrate several motivational predictors at the same time, which is necessary to be able to determine the relative importance of each predictor. So far, previous studies only investigated one kind of motivational predictor, or an undifferentiated mixture of several factors, which will be shown in the following.

According to the theory of planned behavior (Fishbein & Ajzen, 2010), a specific behavior is best predicted by the intention to execute this behavior and the perceived behavioral control (see Figure 1). The intention depends on the attitude toward the behavior, the subjective norm regarding the behavior, and the perceived behavioral control. The latter is to be understood as the subjective estimation of the likelihood that one is able to execute the behavior in a given situation. This corresponds to the concept of self-efficacy expectancy (Fishbein & Ajzen, 2010; Bandura, 1997). In the next sections, we will explain these concepts.

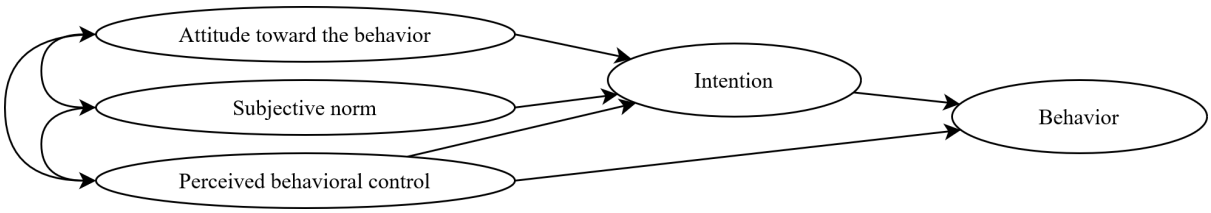

Figure 1. Theory of Planned Behavior (replicated after Fishbein & Ajzen, 2010)

Attitude toward the behavior

Theoretically, the overall attitude toward a behavior consists of various beliefs regarding this behavior, which are salient to the individual in the moment of appraisal. Each belief links the behavior to a specific attribute, e.g., an expected outcome that is a direct consequence of the behavior. Each attribute is of a certain value to the individual, and is realized with a certain likelihood in case the behavior is executed. Thus, the attitude is the sum of all salient beliefs, which in turn represent expectancy*value-interactions of attributes of that behavior.

To conceptualize the global attitude toward a behavior, we use the popular and differentiated distinction by Eccles and Wigfield (2002). The authors distinguish four dimensions of value: utility value, attainment value, intrinsic value, and costs. *Utility value* reflects the perception of the likelihood to which a behavior results in outcomes that lead to consequences positively valued by the individual. *Attainment value* represents how strongly one identifies with the behavior, i.e., perceives the behavior in question as part of one's identity or self. *Intrinsic value* does not describe the value of the consequences of a behavior, but instead the immediate effect of the behavior on oneself while executing it. For example, a behavior might be considered to be interesting or fun. At last, *costs of the behavior*, e.g., time and energy invested, have to be considered as well in order to gather a comprehensive picture of the attitude toward a certain behavior.

In an empirical study, Uhlenbrock (2019) showed that an increase in perceived utility resulted in an increase in several factors regarding the use of evidence-informed reasoning, i.e., strategic knowledge of how to prevent typical errors in evidence-informed reasoning, procedural knowledge of how to identify errors, positive attitudes toward educational science theories, subjective knowledge of educational science theories, and interest in educational science theories. However, the theoretical quality of the written case analysis itself was not influenced by the value manipulations. Kiemer and Kollar (2018) investigated the relation of general attitudes

toward research on learning and instruction with actual use of scientific reasoning activities and found a small but significant relation.

Besides these studies, empirical research that investigated pre-service teachers' attitudes toward evidence-informed reasoning is quite scarce. Lysenko et al. (2014) found positive effects on teachers' use of research-based information for several heterogeneous constructs, which mirror the predictors in the theory of planned behavior: The factor "opinions about research" can be considered as an attitude factor because it contains several utility value items (4 out of 7 items). This factor positively and most strongly predicted the use of research-based information. In summary, the literature suggests that attitudes toward evidence-informed reasoning are relevant predictors of the respective intention and behavior.

Subjective norms

As depicted in Figure 1, a second predictor of behavioral intention are subjective norms. In this context, Fishbein and Ajzen (2010) distinguish injunctive and descriptive kinds of subjective norms. *Injunctive norms* reflect what relevant others think what is supposed to be done in a specific situation. *Descriptive norms* represent the perceived actual behavior of relevant others. These two kinds of norms influence behavior of an individual in different ways: While injunctive norms might induce an expectation to receive rewards or punishments when followed or disobeyed, believing that others actually behave in a certain way might offer clues on what is sensible in a specific situation (Fishbein & Ajzen, 2010).

Regarding descriptive normative beliefs, a study of Demski (2018) is informative in the context of evidence-informed reasoning. She asked 1527 teachers and principals with a questionnaire and interviewed 35 of them about reasons for or against the use of knowledge resources based on scientific evidence. The specific use of evidence in order to stimulate new pedagogical behaviors was only reported in schools with the highest average of evidence use in total teaching staff. This effect can be tentatively interpreted as an effect of a school-climate favoring evidence-informed practice: When one's teacher colleagues use evidence in their practice (= descriptive norm), one is more likely to adopt an evidence-informed practice oneself.

Also, in the study of Lysenko et al. (2014), two factors included aspects of subjective norms: In the factor "awareness activities", three out of seven items resembled descriptive normative beliefs (the rest was more about environmental conditions making transfer to practice easier). In "organizational factors", four out of eight items were related to injunctive normative beliefs (the rest was more about opportunities and resources). Both factors were positively associated with the use of research-based information. Thus, overall, the literature suggests both kinds of normative beliefs to be relevant for an engagement in evidence-informed reasoning.

Perceived behavioral control/self-efficacy

The third predictor in Fishbein and Ajzens' (2010) model is *perceived behavioral control*. Though a certain behavior might be attractive (i.e., having a positive attitude toward the behavior) and there might be social pressure to execute this behavior (i.e., strong subjective norms), individuals may still decide not to carry that behavior out. This happens when they believe that their abilities and/or the circumstances prevent successful execution of the behavior in question. Thus, perceived behavioral control is defined as believing that one "is capable of performing a given behavior" (Fishbein & Ajzen, 2010), which is identical to how Bandura (1997) defines the term *self-efficacy* (as long as self-efficacy is understood as a situational, context-specific construct, not a trait). Therefore, we use self-efficacy as the more common term throughout the rest of this article.

The general relevance of teacher self-efficacy for teaching effectiveness is already well established (e.g., Klassen & Tze, 2014). However, a specific investigation of self-efficacy regarding evidence-informed reasoning is scarce. Lawson et al. (2007) investigated self-efficacy and reasoning ability in a sample of non-major biology students, of which a high percentage were pre-service elementary teachers. The self-reported expectancy to perform well in a series of biology tasks they were asked to solve through reasoning was associated with actual reasoning ability measured by a skill test. This finding illustrates that self-efficacy regarding scientific reasoning might be related to actual scientific reasoning. With an operationalization closer to actual teaching practice, Cevik and Andre (2013) had their participants analyze cases including classroom management problems, and decide upon solutions. The quality of decisions was neither associated with self-efficacy ("expectation to do well in this class"), nor with the confidence in the adequacy of their decisions. According to the authors, this might have been due to the general, only domain- but not task-specific nature of self-efficacy measurement. At last, in the study of Lysenko et al. (2014), three out of seven items of the "opinions"-factor focused on expectancy, and the factor "individual expertise" represented abilities and skills necessary to execute evidence-informed reasoning. Taken together, these items could have constituted a self-efficacy factor, whose items are positively related to teachers' use of research-based information.

In conclusion, findings regarding the association between self-efficacy and evidence-informed reasoning about classroom-related problems are mixed: While general reasoning skills seem to be related to self-efficacy (Anderson et al., 1988; Lawson et al., 2007), reasoning in classroom situations seems not (Cevik & Andre, 2013). However, general evidence-informed practice is associated with indicators of self-efficacy (Lysenko et al., 2014). Therefore, we assume that a combination of acting in an evidence-informed way and reasoning about classroom situations is related to self-efficacy if the latter is measured in a context-specific way.

Hypotheses

In summary, a motivational perspective might be a crucial starting point to understand pre-service teachers' engagement in evidence-informed reasoning. Though most of the presented empirical evidence already justifies the expectation that the theory of planned behavior can be used to explain and predict teaching behavior, pre-service teachers' motivation to engage in evidence-informed reasoning has not yet been investigated in a systematic and comprehensive way. Either were the predictors investigated in isolation from each other, or they were grouped into theoretically heterogeneous constructs (Lysenko et al. 2014). Thus, the relative importance of different motivational predictors still needs to be determined. In addition, only a few studies investigated pre-service teachers so far. Thus, our goal was to determine which motivational factors predict pre-service teachers' engagement in evidence-informed reasoning when being confronted with classroom-related challenges.

We establish the following hypotheses:

1. Pre-service teachers' evidence-informed reasoning is predicted by their intention to engage in evidence-informed reasoning and their self-efficacy to perform this behavior.
2. The intention to engage in evidence-informed reasoning depends on various dimensions of (a) attitudes toward evidence-informed reasoning, (b) subjective norms regarding evidence-informed reasoning, and (c) the self-efficacy to perform evidence-informed reasoning.

Method

Sample

Participants were N = 157 pre-service teachers (M_{age} = 22.76, SD = 3.54, 70.1% female) enrolled in two educational psychology classes at two German universities. On average, students were in their fifth semester (M = 4.87, SD = 2.05) without substantial practical experience. Participation in the training elements of the study was a mandatory part of the classes. However, participation in the scientific data collection was voluntary, though no one opted out.

Procedure

This paper reports on data from a larger study that had five measurement points: After a pre-test (t1), in two training sessions (t2 and t3) pre-service teachers received instructional support to enhance their evidence-informed reasoning about the case scenarios. A post-test (t4) and a follow-up (t5) measured the evidence-informed reasoning skills participants acquired over the course of the sessions.

For the present paper, data from t1 (pretest) and t3 (second training session) were used because the following variables were measured at these times only to establish a longitudinal design. The order of assessments was as follows: In t1, after answering demographic items, participants analyzed the first case scenario. After that, they completed a questionnaire directed at measuring the predictor variables of the current study, i.e., attitudes, subjective norms, and self-efficacy regarding the kind of reasoning behavior they just performed. To measure the dependent variables, i.e., intention and subjective behavior, we used data from the second training session to implement a time lag of two weeks. The intentions were measured before the students analyzed the vignettes. The subjective behavior was measured afterwards. To support students in their case analyses in t3, they received evidence texts on CTML, multi-store model of memory, social-cognitive learning, and self-regulated learning, each of about 500-800 words in length, and a couple of reasoning prompts such as "Please explain the problem based on the two evidence texts".

Instruments

Attitudes toward the application of educational science knowledge

Participants indicated on twelve items from 1 (*not at all true*) to 5 (*absolutely true*) how much value they attribute to the structured application of educational science knowledge to teaching problems. The items were adapted from

Stark et al. (2018). All items were phrased using the same sentence starter: "The structured application of educational science knowledge to teaching problems…". Following the model of Eccles and Wigfield (2002), the scale consisted of the facets (three items each) (1) utility value (sample item: "… is useful to learn."), (2) attainment value (sample item "... is personally highly important to learn."), (3) intrinsic value (sample item: "... is very interesting."), and (4) cost (sample item: "... is a waste of time."). A confirmatory factor analysis yielded a good model fit ($X^2(48) = 71.62$, $p = .015$, CFI = .98, TLI = .97, RMSEA = .06, SRMR = .04, all robust estimates) for the theoretical four factor structure, which also was clearly superior to a one-dimensional solution which might have been reasonable regarding the rather high factor covariations. Cronbach's alphas were satisfactory (α = .78/.82/.85/.84).

Subjective norms regarding the application of educational science knowledge

On six items (to be answered from 1 = *not at all true* to 5 = *absolutely true*), participants indicated their normative beliefs regarding the structured application of educational science knowledge to teaching problems. The items were specifically developed for this study. The scale consisted of the two facets (1) injunctive and (2) descriptive norms.

Three injunctive normative belief items were phrased using the same sentence starter: "People who have an influence on my later teaching behavior think that I should use educational science knowledge to…" (sample item: "... explain teaching problems."). Three descriptive normative belief items were phrased using the same sentence starter: "I believe that professional teachers use educational science knowledge to…" (sample item: "... explain teaching problems."). A confirmatory factor analysis yielded a very good model fit ($X^2(7) = 9.55$, $p = .215$, CFI = .99, TLI = .99, RMSEA = .06, SRMR = .05, all robust estimates) after inclusion of a residual covariance between the first items of each subscale which is probably due to very similar item phrasing. The two-factor-solution was clearly superior to a one-factor-solution. Cronbach's alphas were good (α = .88/.86).

Self-efficacy regarding the application of educational science knowledge

Participants indicated on three items (to be answered from 1 = *not at all true* to 5 = *absolutely true*) their self-efficacy regarding the structured application of educational science knowledge to teaching problems. The items were adapted from the General Self-Efficacy Short-Scale (ASKU; Beierlein et al., 2014). All items were phrased using the same sentence starter: "In the structured application of educational science knowledge to teaching problems,…" (sample item: "... I can rely on my abilities in difficult situations."). Cronbach's alpha was satisfactory (α = .77).

Intention to apply educational science knowledge

To measure participants' intention to apply educational science knowledge to teaching problems, we developed five items (to be answered from 1 = *not at all true* to 5 = *absolutely true*) that referred to the dimensions of the problem analysis students were prompted to conduct (e.g., identification of significant instances, explanation of problem). All items were phrased using the same sentence starter: "In the following case analysis, I want to structurally apply educational science knowledge to teaching problems to…" (sample item: "... explain educational problems."). Cronbach's alpha was good (α = .82).

Subjective behavior regarding application of educational science knowledge

After the case analysis, participants indicated on five items (to be answered from 1 = *not at all true* to 5 = *absolutely true*) their perceived actual behavior while analyzing the case. The same items as for the measure of intention were used with the sentence starter: "In the previous case analysis, I structurally applied educational science knowledge to teaching problems to…". Cronbach's alpha was good (α = .84).

Statistical analyses

To account for sample size restrictions, we used manifest factor scores and applied a stepwise approach to the statistical modeling. First, factor scores were determined by calculating confirmatory measurement models for each predictor group separately and saving the factor scores. In this way, we were able to better represent measurement error compared to an approach using simple means as factor scores. Second, we calculated three separate models predicting intention, i.e., one model with the four facets of attitude as predictors, one with the two kinds of subjective norms, and one with self-efficacy. Third, we entered the significant predictors of each group in the final model (see Figure 2). All CFA and SEM were performed using R [version 4.0.0] with the R-package lavaan [version 0.6-6].

Results

Descriptive results are shown in Table 1. The means of attitude toward the behavior were remarkably high, whereas the other constructs' means were more in the middle of the scale. As expected, correlations within predictor groups were higher than between groups. Intention was associated with almost every predictor except for injunctive norms and self-efficacy. Subjective behavior was significantly associated with every predictor variable except for descriptive norms.

Table 1: Means, standard deviations, and correlations

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. Utility Value	4.20	0.59								
2. Attainment Value	4.07	0.63	.76**							
3. Intrinsic Value	3.73	0.74	.64**	.74**						
4. Costs	1.64	0.64	−.58**	−.64**	−.63**					
5. Injunctive Norms	3.95	0.74	.36**	.34**	.27**	−.29**				
6. Descriptive Norms	3.10	0.90	.28**	.25**	.21**	−.22**	.38**			
7. Self-Efficacy	3.62	0.60	.13	.17*	.20*	−.03	.20*	.21**		
8. Intention	4.01	0.50	.36**	.40**	.31**	−.25**	.15	.21**	.14	
9. Subjective Behavior	3.83	0.54	.38**	.37**	.32**	−.18*	.21**	.14	.23**	.50**

Note. $^{*}p < .05$. $^{**}p < .01$.

In the second modeling step, when controlling for covariation with other predictors of the same group, one predictor for each group of predictors was significantly associated with intention. Figure 2 shows the final path model with a reasonably acceptable model fit ($X^2(2) = 5.70$, $p = .058$, CFI = .96, TLI = .79, RMSEA = .11, SRMR = .04). Overall, the associations described by the theory of planned behavior were replicated. Each predictor group contributed to the explanation of intention and subjective behavior: Intention was determined by attainment value and descriptive norms, and subjective behavior was determined by intention and self-efficacy. There was only one exception: Self-efficacy was only directly related to subjective behavior, but not associated with intention.

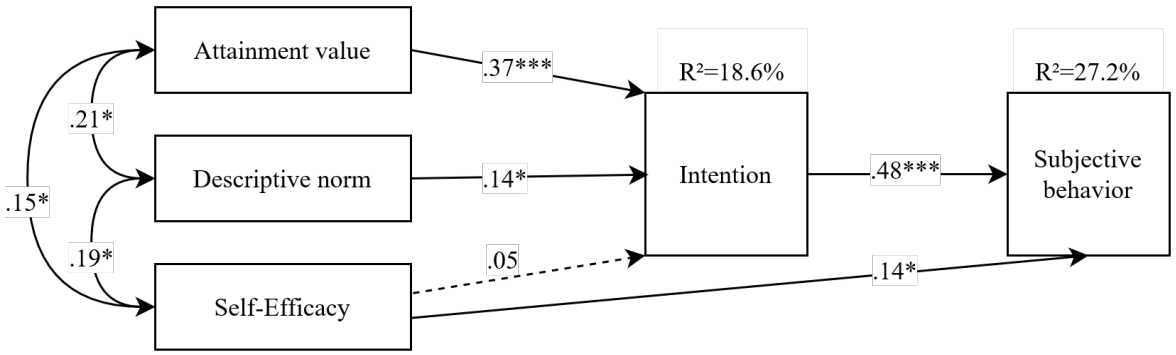

Figure 2. Final Path Model Predicting Structured Application of Educational Science Knowledge to Teaching Problems ($^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$, one-tailed; dotted line indicates non-significant effect with $p = .48$).

Discussion

Our main research question was which motivational factors would predict pre-service teachers' engagement in evidence-informed reasoning when being confronted with classroom problems. In line with the theory of planned behavior (Fishbein & Ajzen, 2010), subjective reasoning behavior was supposed to be predicted by intention to engage in evidence-informed reasoning and self-efficacy (H1). This hypothesis was confirmed by corresponding significant positive regression coefficients. Accordingly, pre-service teachers who intend to engage in evidence-informed reasoning seem to be more likely (to report) to do so when analyzing classroom situations. In addition, the more pre-service teachers feel confident to be able to engage in evidence-informed reasoning in advance, the more they (report to) engage in evidence-informed reasoning afterwards. This association of self-efficacy with subjective reasoning behavior also corresponds to the findings of Lawson et al. (2007) and Lysenko et al. (2014).

Our second hypothesis assumed that intention itself should be predicted by attitudes toward evidence-informed reasoning, subjective norms regarding evidence-informed reasoning, and self-efficacy (H2). This was partly supported in that at least one predictor per group was significantly associated with intention: Among the variables within the construct "attitudes toward the application of educational science knowledge", attainment value turned out to be a significant predictor. Thus, pre-service teachers seem to form an intention to engage in evidence-informed reasoning especially when they find doing so personally important. Of the two variables measuring subjective norms, only descriptive normative beliefs were significant predictors of intention. This means that pre-service teachers seem to form an intention to engage in evidence-informed reasoning also when they think that (real) teachers typically do so as well. These findings reflect results from other studies that also indicate a positive relation between attitude toward evidence-informed reasoning or, more generally, practice (Uhlenbrock, 2019; Kiemer & Kollar, 2018; Lysenko et al., 2014), and between descriptive norms and evidence-use (Demski, 2018; Lysenko et al, 2014). Yet, the fact that we did not find further significant predictors is opposed to findings indicative of an association of injunctive norms with evidence-use (Lysenko et al., 2014). These findings might be explained by adopting the time perspective of a pre-service teacher: For a person still in teacher training, it might be not so relevant what one can accomplish with evidence-informed reasoning later in their professional life (utility), how much fun it will be to solve a daunting classroom problem with scientific precision (intrinsic), or if it takes a lot of effort or not to engage in evidence-informed reasoning (costs) because all these effects are still far away. In contrast, the reward of feeling like a real teacher might be immediately available just when students behave like they think a real teacher would do. The latter aspect is represented in the descriptive norm, and attainment value represents the intensity of identification with this behavior. Thus, if students think real teachers actually engage in evidence-informed reasoning and at the same time identify with this behavior, then they experience the gratification of living up to their role model as soon as they act in the same manner.

Limitations and conclusions

Of course, our study is not without limitations. Most importantly, since the data is based on self-reports, the association between intention and subjective behavior, especially, might be due to common method bias because of very similar item phrasing, memory effects, and/or social desirability because of the subjective norm to conform with one's own previous statements. However, we argue that the almost two hours of processing time for the case analyses in between the two measurements should have reduced these effects, because participants should have forgotten what they reported. We are currently coding the participants' case analyses, so objectively measured behavioral data will be available to corroborate our findings in the future. In general, the effects we found in this study can be considered as rather stable since there was an interval of two weeks between measurement of the predictors and intention. However, the very same interval might also be the reason why there was no effect of self-efficacy on intention: In the meantime, participants' engagement in another training session might have changed their initially perceived level of competence, thus possibly affecting the intention to engage in evidence-informed reasoning during the next session which was measured in the present study. Finally, we did not specify the kind of teaching problem or the theoretical background useful to analyze it before we assessed pre-service teachers' motivational predictors to engage in evidence-informed reasoning. Consequently, our measurement might not have been sensitive to moderating effects of the kind of problem or theoretical topic.

As an implication for future research, the relatively superior importance of attainment value in contrast to utility value sheds new light on the findings of Uhlenbrock (2019), who manipulated utility value to increase engagement in evidence-informed reasoning, but who did not find corresponding effects for all representations of evidence-informed reasoning: Maybe, an induction of attainment value instead of utility value might have resulted in more pronounced effects.

The present findings may also inspire the design of teacher education curricula. When aiming at motivating future teachers to make evidence-informed decisions, we empirically derived indicators where to start best. Uhlenbrock (2019) increased the utility perception of educational science theories with a value-inducing intervention. However, our results point to a different approach: As attainment value seems to be the better predictor of the intention to use and the subjective use of educational knowledge when analyzing teaching problems, and as descriptive normative beliefs also play an important role in that context, we assume that involving professional teachers in motivating pre-service teachers might be most promising: If actual teachers model evidence-informed reasoning in authentic situations, pre-service teachers should be more motivated to reason in an evidence-informed way themselves than if university instructors focus on utility or on expectations of what teachers should do that are formulated by the government or research (Bauer & Prenzel, 2012). Thus, teacher training curricula should not prescribe an engagement in evidence-informed reasoning, but should show real teachers in action as role models that are applying evidence-informed reasoning when confronted with classroom-related problems.

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