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# Smoothing the path to practice: Playful learning raises study happiness and confidence in future roles among student teachers and student ECE teachers

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## ABSTRACT

Researchers investigating the experiences of novice teachers highlight the importance of easing their transition from study to work, including by strengthening their personal resources through active experimentation with future practices. Based on survey data from a large-scale programme evaluation, this paper reports on associations found between the adoption of a hands-on, student-centred approach – playful learning-based teaching (PLT) – during initial training of future professionals in care and education and three key outcomes: students' happiness with their studies, perception of competence and professional readiness. Results showed that PLT was positively associated with all three outcomes, and further, that PLT can feasibly be promoted by equipping lecturers with material resources and peer support to adopt playful elements in their teaching.

## 1. Introduction

As student teachers and ECE teachers move from study to work, many find a mismatch between expectations held about their future work life, and actual experiences once employed; this 'praxis shock' has been called out as a central issue to address during their initial training (i.e., Ballantyne & Retell, 2020). One classic example is when students primarily experience lecture-based teaching during coursework, despite the practice-oriented nature of their future professions in education and care. This situation is problematic, since novice teachers are found to struggle more than experienced peers in terms of remaining resilient and coping with challenges posed by job uncertainty and stress (Schaefer, 2013; Høigaard, Giske, & Sundslø, 2012; Gibbs, 2003). In their recent study with music teachers across career stages, Ballantyne and Retell (2020) found that levels of 'praxis shock' directly influenced the degree of burnout, sense of self-efficacy (or confidence in own professional capability), and well-being among their respondents. In a case study exploring the shifting job entrance motivation of 12 student teachers, Rots and colleagues (2012) noted how the normative, emotional and social aspects of teaching presented constant dilemmas and challenges to their respondents, including self-doubts about their teaching identity and competencies, facing demands they struggled to meet and in

working conditions, which differed vastly from their own deeply held beliefs about how they aspired to work as a teacher.

One proposed solution to this important issue lies in smoothing prospective professionals' path to practice by gradually introducing them to complexities of teaching and pedagogical practice during their initial training; doing so includes offering opportunities to actively experiment with future roles and pedagogies, and work intentionally with their sense of well-being and self-efficacy (Ballantyne and Retell, 2020; Skaalvik and Skaalvik, 2019; Dicke, Elling, Schmeck, & Leutner, 2015; Dicke, Stebner, Linninger, Kunter, & Leutner, 2018; Rots, Kelchtermans, & Aelterman, 2012; Gibbs, 2003). As illustrated by the Rots and colleagues' study, this kind of experimentation goes beyond practicing discrete teaching and classroom management skills – rather, these are open-ended, exploratory coursework practices where students engage with uncertainties common to education professions, and do so within a safe peer community and practice ground (Whitton, 2018). Playful learning-based teaching (PLT) is emerging as one such approach.

In Higher Education (HE) settings, PLT refers to a wide array of hands-on, pedagogical practices that share characteristics of being joyful, actively engaging and meaningful to learners by building on their life experiences, interests and curiosity; further, learners are supported to experiment and iterate with an activity or content, including novel

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tools and approaches, and in collaborative setups where they learn with peers (Forbes 2012; Zosh et al., 2018; Whitton, 2018; Kangas, Siklander, Randolph, & Ruokamo, 2017). Hence, PLT falls within the realm of applied, experiential approaches to learning. The necessity of involving both in-service and pre-service professionals as active participants in their own learning, encouraged through applied approaches and reflection, is increasingly recognised and well-documented (e.g., Korthagen, 2017; Girvan, Conneely, & Tangney, 2016; Clarke & Hollingsworth, 2002). At the centre of these forms of experiential learning is a focus on ‘...lived experience upon which learners can reflect, think and act’ (Girvan, Conneely, & Tangney, 2016, p. 131). Drawing on Kolb’s original definition, learning is conceived of as ‘...the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience’ (1984, p. 41). This focus on experience and its transformation through intentional reflection re-asserts the issues of pre-service professionals being mainly taught about teaching, rather than actively experimenting with practices themselves. Although rooted in this long-standing tradition of experiential learning, PLT itself remains an emerging field.

Proponents of playful teaching in HE have theorised numerous potentials, including counteracting a negative performance culture and fear of failure among students, enhancing their engagement, creating a supportive learning environment and fostering competencies such as critical and creative thinking (Forbes 2012; Koeners and Francies 2020; Whitton, 2018; Nørgård, Toft-Nielsen, & Whitton, 2017). A recent scoping review found that educational designs characterised as ‘playful’ are being applied with student teachers and ECE teachers, both to promote subject-specific learning and domain-general skills; however, conceptualisations of ‘playful learning’ were inconsistent and often missing in the reviewed studies (Boysen, Jensen, von Seelen, Sørensen, & Skovbjerg, 2021). In short, PLT is proposed as a promising approach to equip student teachers and ECE teachers for their future roles; and while empirical studies exist, firmer evidence is yet to be established, including from larger-scale studies.

### 1.1. The context and premise of the evaluation

The potential for fostering professional competencies among student teachers and ECE teachers is the focus of the national Playful Learning Programme in Denmark – by creating playful spaces for students to actively experiment with future roles in early childhood (ECE), primary and lower secondary education, the programme strives to ease students into challenges common to their future work, allowing these dilemmas to grow familiar, and building positive responses and habits that might smooth the transition to work. The present article reports on the baseline evaluation of this programme, including how PLT in HE was operationalised for evaluation purposes through a balance of contextual and theoretical grounding, as well as associations found for student outcomes and implementation factors.

Danish care and education qualifications reside with six university colleges (UCs) located throughout the country. Upon completion, students receive a professional bachelor’s degree in either education (teacher) for primary and lower secondary school settings or social education specialising in early childhood settings (ECE teacher). Degree programmes are designed to bridge between theory and practice in order to: ‘...meet both different students’ interests in a variety of subjects and the need for a qualified workforce in both the private and the public sector’ (Ministry of Higher Education and Science, 2020). For instance, internships in schools and day-care form an integral part of both degree programmes. The six UCs recently formed a shared ambition to prioritize excellence in teaching and learning, signifying a move from primarily using traditional, lecture-style teaching to modelling engaging and child-centred approaches, which students would ideally use in their future care and education roles.

The Playful Learning (PL) Programme was developed to address this

ambition by offering students first-hand experiences with future practices, which evolve around a vision of PLT.<sup>3</sup> Fundamentally, the programme scaffolds experimentation and co-creation within and across the six UCs through a supportive national organisation and programmatic activities. Its organisation consists of a steering committee and daily leadership team at national level, with six local ambassadors and one project manager appointed at each UC. The ambassadors are highly motivated and qualified UC lecturers chosen as experts-among-peers; this role entails experimenting with playful teaching practices at each institution, and later to equip colleagues, thereby expanding the ambassador corps over time. Project managers act as contact points for the national leadership and perform administrative tasks. Programmatic activities combine: *competency development* for ambassadors and project managers, in the form of local workshops on action learning and national seminars featuring external experts as well as insights-sharing across the programme; *PlayLabs*, which are physical spaces designed to inspire and accommodate playful practices at each UC; and *educational experiments* where UC lecturers and students design, test and refine playful educational experiences together in cycles of action learning. Thus, in the PL programme, lecturers and students co-create novel, playful approaches to teaching and learning in an effort to model future professional practice; the premise being that this fosters students’ sense of well-being, as well as their confidence in own abilities as future professionals, thereby bolstering personal resources found to be key in mitigating ‘praxis shock’. Informed by research with early career professionals (e.g., Ballantyne and Retell, 2020; Gibbs, 2003), three aspects of students’ personal resources were identified as central outcomes for the evaluation of the programme: 1) students’ happiness with their studies, indicating their sense of well-being; 2) their perception of competence for the chosen study programme (i.e., teacher or ECE teacher) and 3) readiness to support children’s learning through play in education settings, both reflecting aspects of their sense of efficacy.

### 1.2. Conceptualising student outcomes

The pursuit of a simple, universal definition of well-being has proved immensely difficult, with diverse research traditions offering different emphases (Dodge, Daly, Huyton, & Sanders, 2012). For the baseline evaluation, a definition was adopted, which focused specifically on education professionals, with well-being understood as ‘...a positive emotional state resulting from harmony between the sum of specific environmental factors on the one hand, and personal needs and expectations of teachers on the other’ (Aelterman, Engels, Petegem, & Verhaeghe, 2007, p. 286). As such, this outcome sought to capture students’ enjoyment and their sense of belonging within the study programme. The second and third outcomes addressed students’ sense of professional efficacy. According to Bandura, perceived efficacy is a judgement of capability reflecting the combined influences of a person’s context-activated beliefs about own capability and motivation to use new skills in practice (2006, p. 308). Two efficacy aspects were relevant to the present evaluation: professional efficacy in a broader sense, as in students’ perception of competence for their chosen study programme, and in a specific sense, namely their perceived readiness to use pedagogical practices promoted by the PL programme in future roles. The following sections report on the evaluation approach and results obtained, addressing the following points: 1) how PLT was operationalised for investigation through establishing guiding principles, 2) associations emerging between PLT and student outcomes, and 3) how key factors influenced lecturers’ adoption of PLT, including their attitudes, self-assessed capabilities and access to relevant resources. As such, this article contributes insights on links between lecturers’ use of a playful, student-centred approach to teaching in higher education and personal resources found to smooth students’ path to work, while also identifying

<sup>3</sup> <https://playful-learning.dk/english/>

factors making implementation more and less likely among lecturers.

## 2. Materials and methods

The baseline evaluation took place during the first year of programme implementation where 36 ambassadors and 6 project managers participated in 4 national seminars and 18 local workshops, leading to opening of PlayLabs. At this point, the larger group of lecturers and students at the six UCs were aware of the programme, but not widely involved. Given the co-creative approach used in the PL programme, target playful learning practices could not be predefined for the evaluation but would emerge as the programme progressed. Consequently, a principles-focused evaluation approach was chosen for the study (Patton, 2017). This approach entails focusing on a number of guiding principles that clarify the subject of interest without specifying a priori how these principles are translated into discrete practices and activities, thus balancing systematic evaluation procedures with emergence and context sensitivity. To identify these principles, programme stakeholders were invited for a workshop to co-create statements that reflected the attitudes, capabilities and practices of UC lectures and students when successfully implementing PLT. The stakeholders were two leadership members, along with project managers and ambassadors from five of six UCs, totalling 15 programme attendees (for further details on this process, see Jensen & Morris, 2021). The workshop took place in February 2019, at which point ambassadors and project managers had attended one national seminar, begun the design of local PlayLabs and trialled their first educational experiments. The statements elicited from the stakeholder group echoed five characteristics of playful experiences, describing these as actively engaging, joyful and meaningful to students, and fostering iteration and social interaction in the learning encounter (Zosh et al., 2018). These characteristics served to organize all statements into five draft principles, which were then circulated to the workshop participants for comments and final approval. The resulting principles are listed below, with their order reflecting the emphasis placed on each by the workshop participants:

1. **Iterative and experimenting.** *Teaching is characterized by an experimental and iterative approach to learning* (“Playful learning encompasses working flexibly and intentionally towards goals while being responsive to lecturers’ and students’ needs and interests, as opposed to predefining plans, steps and goals inflexibly”).
2. **Actively engaging.** *Teaching is based on active involvement of both lecturers and students* (e.g., “Teaching should be facilitative – not instructive. Success equals active engagement that promotes deeper, conceptual understanding and ability to apply, rather than passive reception of content”).
3. **Meaningful.** *Teaching engages lecturers and students where they are and expands their horizons* (e.g., “Teaching involves creating learning situations that support lecturers’ and students’ opportunities to explore how and why new content makes sense in their pre-existing framework of understanding own (future) practice”).
4. **Socially interactive.** *Teaching is developed through social interactions between lecturers and students* (e.g., “Lecturers and students co-create, learn and develop together as an integral part of creating learning situations, in which playful learning is facilitated through (role) modelling”).
5. **Joyful.** *Teaching is exciting and generates positive emotions for lecturers and students alike* (e.g., “Through continuously varying and introducing new content, roles, physical learning spaces and ways of facilitating learning, training is surprising, sparks curiosity and evokes enthusiasm. In this way, training inspires lifelong joy of learning”).

Using these PLT principles, lecturer and student surveys were generated for the baseline evaluation. Both surveys included an introductory section with background questions and three separate sections

inquiring into the respondent’s attitudes, capabilities and practices regarding playful learning. The PLT principles, and corresponding, concrete statements elicited during the workshop, were used to generate items for each of these latter sections. As an illustration, two examples of items capturing lecturers’ attitudes regarding playful learning were: “When you think of supporting students’ learning, how important do you think it is...‘To let experiments unfold in the learning process, despite the possibility that you, as a lecturer, become professionally insecure?’ (i.e., *iterative and experimenting*) and ‘To relate what is learned to other contexts?’ (i.e., *meaningful*). Through the process of stakeholders co-creating principles that captured essential aspects of playful learning in their professional context, items were pitched at a level of specificity, which resonated with respondents’ experiences in their study and working contexts, allowing them to judge statements on this basis; likewise, the PLT principles offered a starting point for interpreting survey responses, thus avoiding some of the challenges common to researching playful learning in HE (see e.g., Walsh and Fallon, 2019). The final student surveys consisted of 10 items for attitudes, 11 items for capabilities and 11 items for practices, each reflecting one of the core principles of PLT. Similarly, the lecture survey comprised 10 items for attitudes, 10 items for capabilities and 10 items for practices. All items ranged from 1 (“Not at all”) to 7 (“To a very large degree”).

### 2.1. Study participants

A total of 4050 students and 689 lecturers participated in this initial evaluation. Approximately 60% of the students (2447 out of 4050) were prospective ECE teachers, and 51% of the lectures (327 out of 689) taught ECE teacher students. Data collection was carried out in accordance with ethical guidelines (British Educational Research Association (BERA), 2018) and in line with General Data Protection Regulations: all participants were fully informed and gave written consent for data to be used for evaluation and research purposes; all data were anonymised.

### 2.2. Data collection

In the fall of 2019, surveys were distributed among all lecturers and students at the teacher and ECE teacher programmes across the six UCs. Emails with individual links to surveys were sent to respondents’ UC-specific email addresses. Lecturers and students, who did not respond to the survey within a few weeks, were sent as many as three email reminders. Of a total of 1.350 potential respondents among lecturers, 770 (57%) completed some or all of the survey. The 689 lecturers, who completed the entire survey, were included in this study. Of a total of 30.481 potential respondents among students, 6.401 (21%) completed some or all of the survey. Data from the 4.050 students, who completed the entire survey, were retained in this study.

### 2.3. Quantitative data analysis

The analytical approach adopted primarily relied on linear regression analysis, complemented by descriptive statistics. Linear regression is a method used for predicting average values of a dependent variable given a linear function of the chosen predictor variables; the regression coefficient associated with the different predictor variables can be thought of as comparisons across predicted values (Gelman & Hill, 2007). Three sets of analyses were conducted in the study: two sets of regression analyses and one set of descriptive analyses. The first set of regression analyses investigated the potential impact of PLT on student outcomes, followed by a set of descriptive analyses of the lecturers’ perceptions about the potential consequences of PLT for student outcomes. Finally, in the second set of regression analyses, factors influencing lecturers’ self-assessed use of PLT in their teaching were explored to suggest avenues for enhancing PLT adoption in the Playful Learning Programme, and similar programmes.

All regression analyses were conducted using Stata 16.1. All models

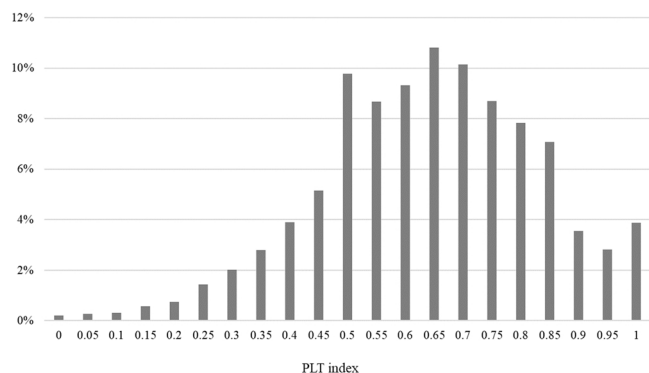


Fig. 1. Distribution of the students' survey scores on the PLT index Note: Mean = 0.62; Std. Dev. = 0.19; N = 4050.

were based on ordinary least squares (OLS) estimates with standard errors clustered on respondents' UC, given the expectation that respondents at each UC would be related to one another in complex ways, which cannot be modelled statistically (see e.g., Gelman & Hill, 2007). To account for potential confounders, i.e., factors that were expected to be associated with both the dependent and independent variables, a set of control variables were included in the regression analyses. In the models investigating the association between PLT and student outcomes, the control variables included whether students were enrolled at the ECE teacher or teacher degree programmes, their study year, gender and number of internships to-date (for a graphical display of all variables included in these models, see Fig. 2 below). In the models investigating determinants of lecturers' self-assessed teaching practices, the control variables were faculty department (ECE teacher versus teacher degree programmes), gender, years of seniority and years of prior work experience (for a graphical display of all variables included in these models, see Fig. 5 below). In all models, respondents' UC affiliation was also controlled for, in order to hold constant all UC-specific factors, which might influence the estimates, such as leadership support, facilities and potential cultural differences across the UCs.

A fairly common issue in survey research, which is worth noting for this study as well, is low response rates, and attendant issues of sample selection bias (Lewis-Beck, Alan, & Liao, 2003). In the present case, 21% of UC students responded, as opposed to 57% of lecturers, which could suggest that students, who were more favourable towards PLT practices, also were more likely to complete the survey. If so, the average responses regarding playful learning attitudes, capabilities and practices would be biased towards more playful learning positive answers. This risk of overestimating the average level of playful learning attitudes, capabilities and practices is mainly an issue when presenting descriptive statistics from surveys. The present study primarily used regression analyses, which investigated correlations among those students and lecturers who decided to respond. Even though these participants on average might be more favourable towards PLT than peers, who responded in part or not at all, such constant bias is less likely to influence the coefficient estimates of the regression analyses (King, Robert, & Verba, 1994).<sup>4</sup> Thus, if the regression analyses showed that students, who perceived teaching at their UCs to be more playful, also tended to have more confidence in their own capabilities, such a finding would not likely be driven by sample selection issues.

#### 2.4. Dependent variables

The main dependent variables of the study were three variables reflecting students' personal resources: study happiness, perception of

competence and readiness to support children's learning through play. These dependent variables were indices composed of items from the student survey, and rescaled to range from 0 to 1. Exploratory factor analyses were conducted for all indices using principal component analysis (PCA) with oblimin rotation. Only items that loaded on a given principal component were included in the indices. Reliability tests, using Cronbach's alpha, indicated that indices were highly reliable ( $\alpha = 0.84\text{--}0.95$ , see also Appendix). The variable 'study happiness' comprised two items from the student survey: one reflecting the degree to which students enjoyed their field of study and one focused on their sense of belonging within their study programme. The second variable, 'student perception of competence' comprised two items, which reflected degree of confidence in their own performance in the study programme and how well they understood the subject taught. The third variable, 'student readiness to support children's learning through play,' consisted of items that inquired into the degree to which students felt equipped to support children's learning based on strategies reflecting the five core principles of PLT. As shown in Table A1 in the appendix, this third index comprised two items for each core principle, and, as the criterion for inclusion, each item had factor loadings around 0.8 on the principal component. For the regression analyses, which explored determinants of lecturers' self-assessed teaching practices based on survey responses, the dependent variable indicated the degree to which lecturers perceived their teaching practices to reflect the five PLT principles. The factor analysis and included items for this variable are displayed in Table A2 in the Appendix.

#### 2.5. Predictor variables

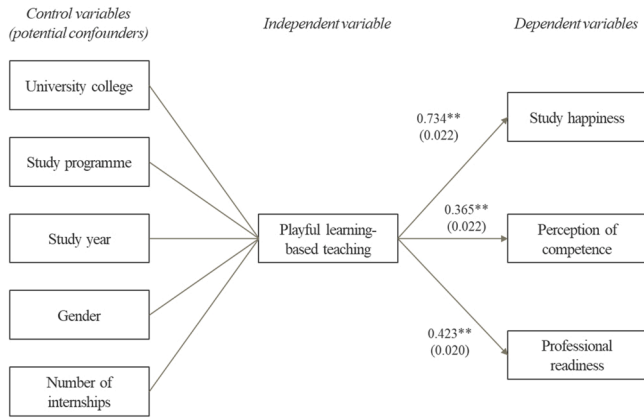
The first set of regression analyses focused on associations between PLT and students' personal resources. The main independent variable was a PLT index composed of items indicating the degree to which students perceived teaching at their UC to reflect the five core principles. Following the same procedure as for the main dependent variables, this PLT index was composed of items from the student survey, and the index rescaled from 0 to 1. The factor analysis for this PLT index and included items are displayed in Table A3 in the Appendix. The distribution of the students' survey scores on the PLT index was moderately left skewed (see Fig. 1), signifying that respondents tended to agree that teaching at their UC reflected PLT principles to some extent. The mean score among 4050 students was 0.62.

In the second set of regression analyses, which explored determinants of lecturers' self-assessed playful learning-based practices, three main predictors were assessed: 'access to relevant resources', 'attitudes to PLT' and 'self-assessed playful learning-based capabilities'. 'Access to relevant resources' was an index composed of seven items reflecting the degree to which lecturers have access to resources, which supported playful approaches to teaching, e.g., resource persons, a collegial community around learning through play, digital equipment and relevant tools and facilities. Factor analysis showed that all seven items loaded on one factor. The index 'attitudes to PLT' comprised six items indicating lecturers' attitudes towards teaching practices reflective of the five PLT principles. The factor analysis and included items for this index are displayed in Table A4 in the Appendix. The final index, 'self-assessed playful learning-based capabilities,' consisted of ten items indicating lecturers' self-assessed capabilities to use teaching practices in line with the five core principles (see Table A5 in the Appendix for factor analysis and the included items for this index).

### 3. Results

This section presents findings from the three sets of analyses: first, results from the regression analyses on the potential impact of PLT on the three student outcomes; second, results from the descriptive analyses of the lecturers' perceptions of the potential benefits of PLT, and finally, results from the regression analyses on factors influencing lecturers' self-

<sup>4</sup> That is, if all observations are affected by the same factor (a constant bias) the slope of the regression line will be unaffected.



**Fig. 2.** Graphical display of variables included in the regression analyses investigating the relationship between playful learning-based teaching and student outcomes *Note:* The regression coefficients for the independent variable illustrated in the figure is based on Models 1, 3 and 4 in Table 1, respectively.

**Table 1**  
The effect of playful learning-based teaching on students' happiness, perception of competence and readiness to facilitate learning through play.

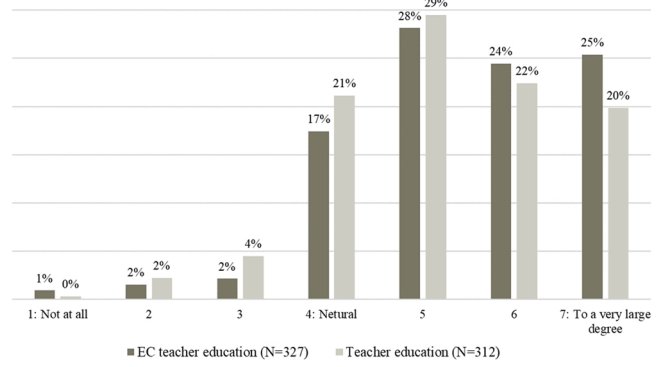
	(1) Student happiness	(2) Student happiness	(3) Perception of competence	(4) Readiness to support children's learning through play
Playful learning-based teaching	0.734 ** (0.022)	–	0.365 ** (0.022)	0.423 ** (0.020)
Playful learning-based teaching (excl. items that reflect joyful)	–	0.679 ** (0.020)		
Teacher (vs EC Teacher) programme	-0.003 (0.005)	-0.004 (0.005)	0.000 (0.005)	-0.045 ** (0.008)
Study year	0.013 (0.009)	0.014 (0.008)	0.022 + (0.010)	0.005 (0.012)
- 2nd (vs 1st) year	0.017 * (0.007)	0.019 * (0.007)	0.052 * (0.014)	0.017 (0.019)
- 3rd (vs 1st) year	-0.011 (0.008)	-0.011 (0.008)	0.056 ** (0.011)	0.020 (0.016)
- 4th (vs 1st) year				
Gender	-0.016 (0.010)	-0.017 (0.010)	0.001 (0.005)	0.010 (0.010)
- male (vs female)	-0.033 (0.035)	-0.034 (0.037)	-0.021 (0.023)	-0.004 (0.036)
- not disclosed (vs female)				
Number of internships	-0.001 (0.008)	-0.009 (0.009)	0.022 + (0.011)	0.061 ** (0.015)
- 1 (vs 0) time	-0.016 (0.013)	-0.017 (0.015)	0.044 * (0.016)	0.111 ** (0.019)
- 2 or more (vs 0) time				
University College dummies	Yes	Yes	Yes	Yes
Observations	4.050	4.050	4.050	4.050
R <sup>2</sup>	0.36	0.31	0.13	0.24

*Note:* OLS estimates with standard errors (clustered on University College) in parentheses. +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ .

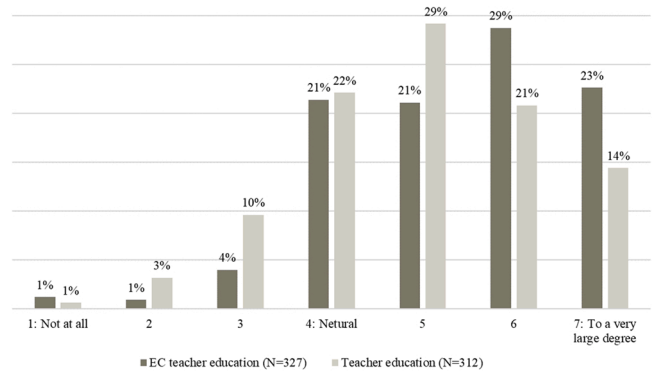
assessed use of PLT in their teaching.

**3.1. Associations between PLT and student outcomes**

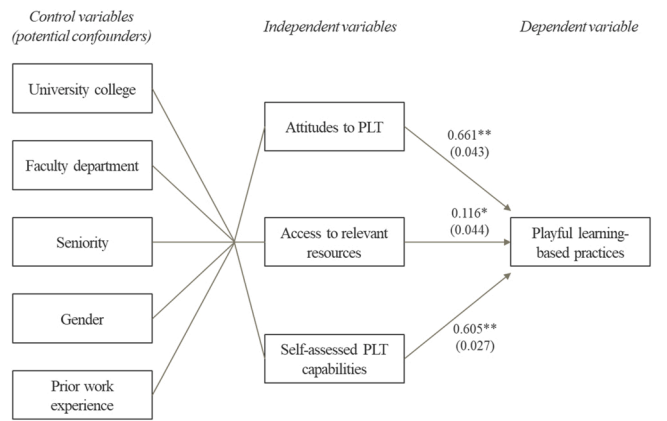
Fig. 2 displays the variables included in the regression analyses investigating relationships between PLT and student outcomes. The Figure also shows main findings of these analyses: PLT is positively and statistically significantly associated with all three outcomes. All three



**Fig. 3.** Lecturers' view on the degree to which PLT strengthens students' learning outcomes.



**Fig. 4.** Lecturers' view on the degree to which PLT strengthens students' professional competencies.



**Fig. 5.** Graphical display of variables included in the regression analyses investigating determinants of lecturers' self-assessed playful learning-based teaching practices *Note:* The regression coefficients illustrated for the independent variables are based on Models 1, 3 and 4 in Table 2, respectively.

relationships are substantively strong, particularly the one between PLT and study happiness.

Table 1 below shows the detailed results from the regression analyses assessing the relationships between PLT and study happiness (Models 1 and 2), perception of competence (Model 3) and readiness to facilitate children's learning through play (Model 4). Model 1 shows a positive

**Table 2**  
Determinants of lecturers' self-assessed playful learning-based practices.

	(1) Playful learning-based practices	(2) Playful learning-based practices	(3) Playful learning-based practices	(4) Playful learning-based practices
Attitudes to PLT	0.661 ** (0.043)	–	0.623 ** (0.040)	0.298 ** (0.042)
Access to relevant resources	–	0.208 ** (0.047)	0.116 * (0.047)	0.026 (0.023)
Self-assessed capabilities regarding PLT	–	–	–	0.605 ** (0.027)
Faculty department	0.036 * (0.012)	0.026 (0.020)	0.033 + (0.013)	0.024 * (0.007)
- teacher (vs EC teacher)	0.062 + (0.030)	0.062 (0.036)	0.049 (0.035)	0.025 (0.024)
- teacher and EC teacher (vs EC teacher)				
Gender	0.001 (0.015)	-0.049 * (0.017)	-0.008 (0.012)	-0.019 (0.010)
- male (vs female)	0.024 (0.022)	0.001 (0.019)	0.025 (0.020)	-0.009 (0.022)
- not disclosed (vs female)				
Years of seniority	0.005 (0.005)	0.005 (0.004)	0.004 (0.004)	-0.003 (0.003)
Years of prior work experience	-0.004 (0.003)	-0.002 (0.003)	-0.004 (0.003)	-0.003 (0.003)
University College dummies	Yes	Yes	Yes	Yes
Observations	689	656	656	656
R <sup>2</sup>	0.30	0.11	0.12	0.61

Note: OLS estimates with standard errors (clustered on University College) in parentheses. +  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ .

**Table A1**  
Factor analysis of items on students' perceived readiness to facilitate learning through play.

Survey question: "To what degree do you feel equipped to support children's learning..."	Core principle	Factor 1
"... by experimenting with roles, content and assumptions?"	Iterative and experimenting	<b>0.81</b>
"... by allowing them to be co-creators of knowledge?"	Actively engaging	<b>0.82</b>
"... by allowing them to share experiences and ideas with each other?"	Socially interactive	<b>0.83</b>
"... in ways that are surprising and exciting to them?"	Joyful	<b>0.83</b>
"...by allowing them to relate what is being taught to other contexts?"	Meaningful	<b>0.83</b>
"... by using mistakes in a positive and constructive manner?"	Iterative and experimenting	<b>0.78</b>
"... by assuming a facilitating rather than instructing role?"	Actively engaging	<b>0.82</b>
"... by allowing them to cooperate when solving problems?"	Socially interactive	<b>0.81</b>
"... by piquing their curiosity?"	Joyful	<b>0.84</b>
"... by relating to and expanding their existing knowledge and experiences?"	Meaningful	<b>0.82</b>

Note: Principal component analysis (PCA) with oblimin rotation. Questions marked in **bold** are included in the index of students' perception of their readiness to facilitate children's learning through play. Cronbach's alpha is 0.95 indicating a highly reliable scale coefficient.

**Table A2**  
Factor analysis of items on lecturers' self-assessed playful learning practices.

Survey question: "To what degree do you carry out teaching..."	Core principle	Factor 1
"... where students can find answers themselves and create new knowledge?"	Iterative and experimenting	<b>0.78</b>
"... where you assume a facilitating rather than instructing role?"	Actively engaging	<b>0.72</b>
"... where students cooperate to solve problems?"	Socially interactive	<b>0.77</b>
"... with an eye for the students' professional interests?"	Joyful	<b>0.70</b>
"... where learning is being related to other contexts?"	Meaningful	<b>0.67</b>
"... where mistakes are used in a constructive manner?"	Iterative and experimenting	<b>0.63</b>
"... where students are co-creators of knowledge?"	Actively engaging	<b>0.83</b>
"... where students share knowledge and ideas with peers?"	Socially interactive	<b>0.77</b>
"... that varies in terms of tasks and activities?"	Joyful	<b>0.67</b>
"...that is based on students existing knowledge and experiences?"	Meaningful	<b>0.72</b>

Note: Principal component analysis (PCA) with oblimin rotation. Questions marked in **bold** are included in the index of lecturers' self-assessed playful learning practices. Cronbach's alpha is 0.90, indicating a highly reliable scale coefficient.

**Table A3**  
Factor analysis of items on students' assessment of playful learning-based teaching.

Survey question: "Does teaching at your university college..."	Core principle	Factor 1	Factor 2
"... allow students to experiment with their own hypotheses and ideas?"	Iterative and experimenting	<b>0.76</b>	<b>-0.12</b>
"... primarily take an instructing form where you listen to other's presentations?"	Actively engaging		
(counter item)	-0.03	0.96	
"... allow you to learn together with your peers and not just on your own?"	Socially interactive	<b>0.66</b>	<b>0.16</b>
"... make you want to learn more?"	Joyful	<b>0.83</b>	<b>0.09</b>
"... make you enthusiastic?"	Joyful	<b>0.83</b>	<b>0.12</b>
"... give you experiences and insights that you can apply in practice?"	Meaningful	<b>0.80</b>	<b>0.11</b>
"... evoke your imagination?"	Iterative and experimenting	<b>0.84</b>	<b>-0.12</b>
"... allow students to be cocreators of knowledge and learning?"	Actively engaging	<b>0.86</b>	<b>-0.12</b>
"... allow students to develop new learning together?"	Socially interactive	<b>0.84</b>	<b>-0.02</b>
"... make learning fun?"	Joyful	<b>0.87</b>	<b>-0.07</b>
"... relate to and expand your existing knowledge?"	Meaningful	<b>0.80</b>	<b>0.04</b>

Note: Principal component analysis (PCA) with oblimin rotation. Questions marked in **bold** are included in the index of students' assessment of the degree to which the teaching they experience involves playful learning-based practices. Cronbach's alpha is 0.94, indicating that the index is highly reliable.

and statistically significant<sup>5</sup> association, indicating that students who perceive teaching at their UC as more playful, are also more likely to rate their study happiness higher. This association is very strong: even with all control variables held constant, the regression coefficient of 0.73

<sup>5</sup> Following conventional usage, we denote a coefficient estimate 'statistically significance' when the p-value is smaller than 0.05 (see, e.g., Gelman and Hill, 2007).

**Table A4**

Factor analysis of items on lecturers' attitudes to playful learning-based practices.

Survey question: "To what degree do you agree that..."	Core principle	Factor 1	Factor 2
"... students learn best when their imagination is evoked"	Iterative and experimenting	0.38	0.70
"... students learn best when they have influence on goals and content?"	Actively engaging	0.26	0.78
"... interaction between students is important for their learning outcomes?"	Socially interactive	0.49	0.47
"... faculty members should pay attention to what piques students' curiosity?"	Joyful	0.61	0.43
"... teaching should be based on students' existing knowledge?"	Meaningful	0.37	0.40
"... it is important that teaching involves experimentation?"	Iterative and experimenting	0.66	0.13
"... it is important for faculty members to assume a facilitating rather than instructing role?"	Actively engaging	0.68	0.03
"... it is important that teaching allows all students to participate and contribute?"	Socially interactive	0.79	0.11
"...it is important that teaching is characterized by variation?"	Joyful	0.83	0.07
"...it is important that teaching is related to other contexts?"	Meaningful	0.78	0.39

Note: Questions marked in **bold** are included in the index of lecturers' attitudes to playful learning-based teaching. Cronbach's alpha is 0.84, indicating that the index is highly reliable.

**Table A5**

Factor analysis of items on lecturers' self-assessed capabilities regarding playful learning.

Survey question: "To what degree do you feel equipped to carry out teaching..."	Core principle	Factor 1
"... that experiments with roles, content and assumptions?"	Iterative and experimenting	0.70
"... where students are co-creators of knowledge?"	Actively engaging	0.79
"... where students are able to share experiences and ideas with peers?"	Socially interactive	0.80
"... that is characterized by variation?"	Joyful	0.76
"...that is related to other contexts?"	Meaningful	0.74
"... where mistakes are used in a positive and constructive manner?"	Iterative and experimenting	0.71
"... where you assume a facilitating rather than instructing role?"	Actively engaging	0.76
"... where students cooperate to solve problems?"	Socially interactive	0.80
"... that piques students' curiosity?"	Joyful	0.81
"... that is based on students' existing knowledge and experiences?"	Meaningful	0.75

Note: Principal component analysis (PCA) with oblimin rotation. Questions marked in **bold** are included in the index of students' self-assessed capabilities regarding playful learning. Cronbach's alpha is 0.92, indicating that the index is highly reliable.

means that a 1-unit increase in PLT results in 0.73-unit increase in study happiness. In other words, Model 1 in Table 1 shows that when students, who perceive teaching at their UC to reflect the core PLT principles to the highest possible degree, are compared with peers, who perceive teaching to reflect these principles to the lowest possible degree, the first group scores 0.7 higher on the study happiness index ranging from 0 to 1, on average.

Model 2 explored whether this strong association could be due to a conceptual overlap between study happiness and the PLT principles, especially the fifth principle *joyful*, meaning that students would be unlikely to rate teaching at their UC as joyful without also stating that

they are happy with their field of study. To preclude this potential source of bias, a new PLT index was computed, which excluded all items that reflected the principle *joyful*. As shown in Model 2, the regression coefficient between PLT and study happiness only dropped marginally from 0.73 to 0.68, and the association remained statistically significant.

Model 3 investigated the association between PLT and students' perception of competence, finding again a positive and statistically significant relationship. This finding indicates that students, who experience PLT, deem themselves to do well in their study programme and have a good subject understanding, compared to peers who do not experience PLT. The relationship between PLT and student perception of competence (Model 3) is not as strong as that between PLT and study happiness (Model 1): a 1-unit increase in PLT results in a 0.37-unit increase in student perception of competence, and as such, this relationship remains significant.

Finally, in Model 4, PLT was found to be positively associated with students' perception of readiness to facilitate children's learning through play. That is, when students experience UC teaching that reflects the PLT principles, they feel better equipped to support children's learning using playful approaches: a 1-unit increase in PLT results in a 0.42 increase in students' readiness to support children's learning through play.

In terms of the control variables, no indication was found that either study happiness or perception of competence varied significantly for student at the teachers and EC teachers programmes. That said, prospective ECE teachers did see themselves as more ready to support children's learning through play. This finding is of little surprise, since play-based practices have long formed a more integral part of Danish early education (Jensen, 2011). Also of little surprise was the result that 1st-year students perceived themselves as less competent than their 'older' peers, as seen from the number of internships being positively related to perception of competence. Internships were also positively associated with students' feeling of readiness to support children's learning through play.

### 3.1.1. Lecturers' perception of the effects of PLT on student outcomes

In order to validate the main findings presented above, which were based on students' perceptions, this section presents results from analyses of lecturers' view on how PLT influences their students, based on two items from the lecturer survey: "To what degree do you agree that playful approaches to learning strengthen students' learning outcomes" and "To what degree do you agree that playful approaches to learning strengthen students' professional competencies". That is, although these measures intend to validate students' perceptions, they are based on lecturers' perceptions, and not objective measures of performance. As shown in Fig. 3, approximately three out of four lecturers tended to agree that PLT strengthens students' learning outcomes, while only a small group disagreed that PLT strengthens students' learning outcomes (5% of lecturers of student ECE teachers had responses in the 1–3 range, compared to 6% of lecturers of student teachers); the remaining lecturers were neutral to this statement. Fig. 3 further shows that lecturers of student ECE teachers agreed with this position to a slightly higher degree than did lecturers of student teachers. This pattern can likely be explained, as argued above, by the more prominent role which play-based approaches hold among early education professionals (Jensen, 2011).

As regards lectures' views on the influence of PLT on students' professional competencies, shown in Fig. 4, results indicate much the same pattern; a larger part of lecturers' at the teacher education disagreed that PLT strengthens their students' professional competencies (14% of lectures with responses in the 1–3 ranges, compared to 6% of lecturers of student ECE teachers). In conclusion, results from the lecturer survey supported those of the regression analyses, in that PLT was deemed to be positively associated with student outcomes by the lecturers themselves.



### 3.1.2. Factors influencing lecturers' self-assessed use of PLT practices

This section turns towards results from regression analyses on factors influencing lecturers' self-assessed PLT practices, i.e., the degree to which lecturers perceived their teaching to align with the five core principles. The structure of the analyses is displayed in Fig. 5 together with the main findings: both pro-PLT attitudes, access to relevant resources and self-assessed capabilities regarding PLT are positively and statistically significantly associated with lecturers' tendency to practice PLT in their teaching. The relationship between lecturers having access to relevant resources and for them to practice PLT is the weakest of the three.

Table 2 shows the detailed results from the regression analyses. Model 2 shows that lecturers' attitudes to PLT is closely connected with their tendency to teach according to the principles of learning through play. Lecturers, who agreed that PLT has positive influences on students' learning outcomes, were thus much more likely to integrate play-based approaches in their teaching: 1-unit increase in attitudes to PLT results in a 0.66-unit increase in self-assessed playful learning-based practices.

Next, Models 2 and 3 addressed lecturers' access to PLT-relevant resources, such as collegial support, printed materials, electronic equipment and facilities that inspire play-based approaches to learning, and their self-reported PLT practice. Model 2 shows that lecturers who reported greater access to PLT resources were also more likely to agree that their teaching practices reflected PLT principles. However, since lecturers who have pro-PLT attitudes may be more likely to demand or develop PLT-relevant resources, this relationship may be confounded by lecturers' attitudes to PLT. Therefore, 'attitudes to PLT' was included as an independent variable in Model 3. As shown, the regression coefficient for access to relevant resources remains statistically significant but loses some of its predictive power: a 1-unit increase in access to relevant resources increases lecturers' self-assessed playful learning-based practices by 0.11 on a 0–1 scale.

Model 4 considers the relationship between lecturers' self-assessed capabilities regarding PLT and their practices. In this model we include both attitudes to PLT and access to relevant resources as independent variables, since both may confound the relationship between self-assessed PLT capabilities and practices. Pro-PLT lecturers are more likely to purposely seek to advance their PLT capabilities (e.g., through competence development), and lecturers who have access PLT-relevant resources are more likely to be motivated to experiment with PLT in practice. The results show that self-assessed PLT capabilities is strongly and statistically significantly associated with self-assessed PLT practices: a 1-unit increase in self-assessed capabilities regarding PLT results in a 0.61 increase in self-assessed PLT practices. Model 4 also shows attitudes to PLT and access to relevant resources loses much of their predictive power when self-assessed PLT capabilities is introduced to the model (and access to relevant resources even loses its statistical significance). This finding suggests that parts of the effects of these factors are mediated by self-assessed capabilities; that is, pro-PLT attitudes and access to relevant resources positively influence PLT practices partly because they motivate and enable lecturers to increase their capabilities to engage in PLT practices. At the same time, the findings presented in Table 2 suggest that competence development, by enhancing lecturers' capabilities regarding PLT, forms a key strategy for enhancing PLT practices – and thereby for positively influencing student outcomes.

Noting the control variables in Table 2, seniority and prior work experience seem to have little influence on the likelihood of lecturers integrating play-based approaches in their teaching. On gender, Model 2 suggests that male lecturers were less likely to teach according to the PLT principles than their female colleagues. This relationship does not exist when controlling for attitudes to PLT, suggesting that female lecturers are more likely to practice PLT because they have relatively more pro-PLT attitudes. There is also some indication that lecturers of student teachers are more likely to perceive their own teaching to be playful than colleagues working with student ECE teachers. Hence, although lecturers of student teachers are relatively less convinced that PLT

strengthens student learning outcomes and professional competencies (cf. Figs. 3 and 4), they are relatively more likely to perceive their own teaching as reflecting the core principles. A final point in this regard is that student teachers were significantly less likely than their ECE peers to perceive teaching at their UC to be based on the learning through play principles.

## 4. Discussion

The transition from study to work is often fraught with challenges for novice professionals in care and education. Researchers have highlighted the need for strengthening their well-being, reflection and sense of self-efficacy to ease this shift. Engaging student teachers and ECE teachers in active experimentation with future roles and practices has been put forth as a promising strategy (e.g. Ballantyne and Retell, 2020; Skaalvik and Skaalvik, 2019). This strategy formed part of the premise of a national programme in higher education, the Playful Learning Programme. The present article used survey data from the programme's baseline evaluation to explore the merits of engaging students in playful learning-based teaching (PLT) to promote essential personal resources – namely their sense of happiness and belonging (well-being) within a coursework context, perception of competence for their study programme and readiness to use PLT practices in future professional roles with children.

The results showed that students, who perceived teaching practices at their UC to hold playful qualities to a higher degree (i.e., meaningful, actively engaging, iterative, socially interactive and joyful), also had higher scores on all personal resources: study happiness, perception of competence and professional readiness. A second and related finding was that lecturers in the study tended to perceive PLT as strengthening students' learning outcomes and professional readiness, and as such, they deemed PLT a worthwhile pursuit. Notably, the study found similar patterns for student and lecturer respondents, as well as for lectures of both student teachers and ECE teachers, in terms of the potential for PLT to promote student competencies and readiness. Taken together, these results confirm theorized benefits of playful learning in higher education settings (Whitton, 2018), and add evidence to the salience of offering active experimentation and engaging practices to promote personal resources in student teachers and ECE teachers. These findings align with recent research conducted in the US, which strove to unpack 'high-impact' practices in teacher preparation programmes: based on faculty interviews, student surveys and follow-up interviews with teacher students, the authors found applied and collaborative learning, understanding of diverse perspectives and constructive feedback to be essential for student engagement and learning (Rodriguez and Koubek, 2019).

On factors influencing lecturers' self-assessed use of PLT, results showed that when lecturers held positive attitudes towards PLT, had access to relevant resources, and judged their own capabilities for PLT to be higher, their self-reported degree of implementation was likewise high. Of these factors, lecturers' capabilities for PLT stood out as a particularly promising avenue for influencing teaching practices, seconding findings from the wider literature on professional development in education settings (e.g. Korthagen, 2017; Girvan, Conneely, & Tangney, 2016; Walter and Briggs, 2012; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). These results hold implications for efforts to promote student-centred teaching in higher education – in Denmark and internationally.

In the Danish UC context, the Playful Learning programme's efforts could benefit from focusing on developing lecturers' skilled use of PLT in their professional planning, practice and reflection. Adopting playful, student-centred pedagogies, especially in settings characterized by lecture-based teaching, can entail fundamental shifts; for instance, from lecturer-centred planning to sharing teaching decisions with students. Again, ensuring that lecturers build capabilities in a professional learning community is likely essential for successful implementation,

although more work is needed to understand the trajectories of how lecturers learn and shift their teaching practices (Kennedy, 2016). Further, the positive attitudes towards PLT, which predominated in this context, are worth noting, in that the Danish UC context could be called 'ripe for change'. From an international perspective, such positive attitudes are not guaranteed among lecturers of future teaching professionals. For instance, while countries across Europe strive to adopt education reforms promoting student-centred approaches in higher education, these approaches are understood and realized in widely different ways (Klemenčič, 2017). As such, extended programme efforts could be required, with special attention paid to discerning lecturers' concepts of student-centred teaching and co-developing approaches that make sense for their context (Jensen & Morris, 2021).

Finally, the results also revealed interesting inconsistencies: although lecturers of student teachers were relatively less convinced of PLT's potential to promote their students' outcomes and professional readiness (compared to lecturers of student ECE teachers), they considered their own teaching as holding playful qualities – this was despite the fact that student teachers were significantly less likely to perceive teaching at their UC as reflecting PLT, compared to their ECE peers. Finding a gap between professionals' beliefs about teaching and their actual practice is fairly common in education research (e.g. Buehl & Beck, 2015), though rarely as in the present sense, where respondents showed less preference for an approach, while estimating higher use of that same approach. The result could relate to issues of social desirability, meaning that respondents' ratings lean towards an ideal, rather than their actual approach. Another explanation could rest with a lower validity or accuracy of the students' reports. However, in their review of past survey studies comparing teacher and student reports of instructional practices, Desimone and colleagues (2010) noted that older students' ratings of instruction quality tended to correlate highly with their teacher's ratings. Hence, the inconsistency found in the present study warrants further investigation.

#### 4.1. Limitations and potentials for future research

The findings and implications presented in this article offer valuable additions to the literature on smoothing the path for student teachers and ECE teachers into their future professions. Even so, there are several limitations worth noting. First, the response rates were low, particularly among students (21%). As discussed above, this might bias the reported descriptive statistics towards answer in favour of PLT. However, low response rates are less likely to bias the coefficient estimates of the regression analyses, which form the main foundation of findings presented in this study.

Second, the regression analyses relied exclusively on survey data, and with both dependent and independent variables being composed of perception-based indicators, endogeneity concerns loom large. For example, although experiencing actively engaging teaching may cause students to enjoy their studies more, it may hold even true that happy students are more likely to *perceive* teaching to hold qualities reflected by the PLT principles, because they themselves are more likely to invite interaction with their peers and lecturers and seek meaning in their educational experiences; hence, the coefficient estimates presented in the study cannot be interpreted as causal effects. Relying solely on perception-based indicators also means that the assessment of student' competencies are not based on objective, student-level performance measures such as test scores. Future studies could limit these concerns by developing more controlled settings, such as quasi-experiments, in which certain groups of students are 'treated' with PLT and others are not. Such studies could help clarify the connections between teaching practices and student outcomes, in order to corroborate or contrast with the findings presented here.

Third, the data collected for this study only present a snapshot of the students' degree programme and the lecturers' teaching careers. Although there is little indication that the data collection period was

unique in any way, it would be relevant to track changes in playful learning attitudes, capabilities and practice over time. This would help answer questions such as: are concurrent increases in PLT and student outcomes observed over time? And do students, who perceive teaching at their UC to be playful, experience less of a praxis shock once employed? These questions will remain in focus for the programme evaluation over the coming years.

#### CRedit authorship contribution statement

**Hanne Jensen:** Conceptualization, Methodology, Writing – original draft. **Lasse Lykke Rørbæk:** Methodology, Investigation, Formal analysis, Visualization, Writing – review & editing.

#### Role of the funding source

This evaluation study was funded by the LEGO Foundation, Denmark. The funder was consulted in the study design, data collection, analysis and interpretation of data, in the writing of the report, and in the decision to submit the article for publication.

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#### Declaration of Interests

The authors have no competing interests to declare.

#### Appendix

See Table A1 to A5.

Table A1-A5 present exploratory factor analyses (principal component analysis with oblimin rotation), which formed the basis of the index construction.

Only items that loaded on a given factor were included in the indices. If several factors were identified, the index was formed based on the items loading on the factor explaining most of the common variance of the observed variables ('Factor 1' in the tables below).

In terms of content, this factor reflects the latent variable of interest, for example, 'perceived readiness to facilitate learning through play' in Table A1.

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