Enhancing the Quality of Pre-service Teachers' Learning in Teaching Practicum

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Abstract

This study aims to explore the relationship between the supporting factors and learning outcomes of a teaching practicum model for an initial teacher education programme in Hong Kong. Identifying the predictive relationships of the supporting factors for pre-service teachers' teaching practicum and their learning outcome could help promoting the quality of the programme. There were 229 pre-service teachers participated to a questionnaire survey of a quasi-experimental design. Confirmatory factor analysis and reliability test were used to confirm the constructed validity and reliability of the survey instrument. A Structural Equation Model was applied to explore the predictive relationship between the supporting factors and their learning outcomes. Results show that campus-based courses, school mentor support and pre-service teacher's self-efficacy were identified to be the supporting factors for their learning outcomes which include instructional design, managing learning activities and assessment. Strengthening school partnerships, providing mentor training and enhancing the element of assessment for learning in campus based course are recommended to the teacher education programme.

Keywords: Field Experience, Pre-service Teacher Education

Introduction

Teaching practicum is the most important part of teacher education programs in terms of pre-service teachers' ongoing professional development (Howitt, 2007; Loughran, Mulhall & Berry, 2008). It is viewed as the most critical factor in the development of teaching skills and acquiring pedagogical knowledge (Tang, 2003). It provides opportunities for pre-service teachers to internalize the theories learned in the campus courses into their own knowledge by practicing the theories in classroom teaching under the guidance and support of their school mentors. Therefore teaching practicum serves as a platform to bridge the theory and practice gap in initial teacher education (Darling-Hammond, 2006). During teaching practicum, they find opportunity to put theories into practice in the real school environment (Hanson & Herrington, 1976). Pre-service teachers' understanding of their professional and self effacacy is shaped by teaching practicum (Danielewicz, 2001). Identifying the supporting factors for pre-service teachers learning in the teaching practicum could help improving the teacher education.

Teacher education programme could be articulated by Grossman et al's (2009) framework of representation, decomposition, and approximation of practices. Representation of practices comprises different ways that practice could be represented through lectures and tutorials in the university campus. Decomposition of practices involves breaking down the practice into its constituent parts and the engagement of mentors to provide support to pre-service teachers. Approximation of practices refers to the opportunity to engage in teaching practices. The campus-based

courses and school mentor supports of the model therefore exemplify the representation and decomposition of practices. University professors present and decompose pedagogical theories and practices including instructional design, assessment skills, activities management, and a range of case study examples through the lectures and tutorials. The school mentors also support the decomposition of the theories and practices to the pre-service teachers through learn-by-doing approaches. They give pre-service teachers feedback on their skills in instructional design, assessment, and managing activities. Both campus-based courses and school mentor supports are essential factors for supporting pre-service teachers' effective learning. Both the courses and mentor supports aim to activate participants' self-efficacy. The study evaluates the effectiveness of a teaching practicum model which integrates these factors for supporting pre-service teachers' learning. It is expected that the model would provide insights for the improvement of professional programmes of initial teacher education.

Literature review

The literature highlights the importance of presenting educational practices in campus-based courses (Smith & Lev-Ari, 2005; Zeichner, 2010), the articulation of the practices by mentors in teaching practicum (Rodgers, A. & Keil, V. L., 2007), and activating pre-service teachers' self-efficacy for effective learning in their teaching activities (Doyle, 1997). The factors for supporting pre-service teacher learning in their teaching practicum includes the campus-based courses, partnership school mentoring support and activating pre-service teachers' self-efficacy through the delivery of their teaching practicum.

Campus-based course

Teaching practicum should be aligned with the theoretical and evidence-based teaching procedures taught in methods course to foster meaningful teaching experience (Zeichner, 2010). Campus based course plays a very important role in the development of the pre-service teacher which has a great impact on the quality of their teaching practicum. The programme design should be comprehensive enough to cover different teaching strategies that could develop a concrete theoretical basis on their teaching. The subject matter courses should equip them with substantial subject knowledge to cope with the curriculum of the practicum schools. The pedagogy courses should equip them with substantial pedagogical content knowledge so that they are confident in their teaching practicum (Smith & Lev-Ari, 2005)

School mentor supports

Mentoring has been identified as a mechanism for supporting teaching practice, in the compulsory school and higher education contexts (Feiman-Nemser, 1996). Mentors were influential on the development of prospective teachers (Hudson, 2005; Koerner, 1992). Hudson (2005) emphasized the role of mentoring in prospective teachers' development as a teacher and reported that mentors' personal attributes, pedagogical content knowledge, and feedback were effective on prospective teachers' improvement. The influence of the school mentors on pre-service teachers' attitude and perceptions has been found to be greater than the influence of their university professors (Richardson-Koehelr, 1988). Lim and Chan (2007) pointed out that tutors could be a role model for prospective teachers in terms of prospective teachers' understanding of teaching profession. University professors and school mentors should work closer together as a teaching team (Casey & Howson, 1993). Insufficient

training for school mentors is a serious challenge to creating consistent and optimal teaching practicum for pre-service teachers (Rodgers & Keil, 2006). The influence of school mentors on pre-service teacher self-efficacy and perceptions has been found to be greater than the influence of their university professors. Therefore it is important that school mentors should masters the subject knowledge and should be experienced in teaching. They are expected to share effective teaching skills with the pre-service teachers and provides effective feedback and to them for improving their teaching, as well as broaden their horizon of in teaching and learning.

Pre-service teacher's self-efficacy

Self-efficacy is the belief in one's capabilities to organize and execute the courses of action required to produce given attainments (Bandura, 1997). It provides a measure of effective learning in the context of initial teacher education (Cheung, 2006). Pre-service teachers' self-efficacy would have an impact on how they think, feel, teach, and learn, and therefore self-efficacy is a predictor for pre-service teachers' learning effectiveness.

Learning Outcomes

Teaching practicum of an initial teacher education programme should address the need to produce pedagogical knowledge including instructional design, managing the classroom learning activities, and assessment of learning (Smith & Lev-Ari, 2005). These kinds of pedagogical knowledge are also the expected key learning outcomes of the teaching practicum.

Instructional design

Instructional design involves analysis, design, development, implementation, and evaluation of a lesson (Molenda, 2003; Strickland, 2006). It includes knowing how to analyse learner characteristics and tasks to be learned and identify learner entry skills; how to design learning objectives and choose an instructional approach; how to develop instructional or training materials; how to implement the lesson and deliver the instructional materials; and how to evaluate the lesson plan and recommend the materials that achieved the desired goals. Pre-service teachers should demonstrate the competency in selecting teaching materials, determining the subject knowledge of the topic before formulation of lesson plan, making a balance between the curriculum goal and students' individual needs, and broadening students' learning experience as their principle on designing teaching activities in their teaching practicum.

Assessment strategies

Assessing student performance is also a critical aspect in the teaching practices. It provides feedback to determine the extent to which instructional objectives have been met, and guides decisions about large-group instruction or the development of individualized instructional programmes. Research reveals that there is a causal relationship between classroom assessments and student performance in standardized tests (Stiggins, 1999a). Pre-service teachers are expected to demonstrate their assessment skills to support student learning by asking student questions and providing assignments so as to evaluate and monitor student learning progress. After collecting students' feedback, pre-service teachers need to take students' learning difficulties and their misconception into the instructional design and formulate the next lesson plan in their teaching practicum.

Managing learning activities

Managing learning activities refers to more than discipline or control, but rather spans a broad range of activities such as arranging the physical environment, establishing and maintaining classroom procedures, monitoring pupil behaviour, dealing with misbehavior, and keeping students on task in a productive environment (Sanford, Emmer & Clements, 1983). Managing class learning activities is an essential learning outcome in teacher education programmes. Pre-service teachers are expected to demonstrate the competency for learning implementation and how to how to apply pedagogical knowledge into their teaching practice. These kinds of pedagogical knowledge are expected to be generated from the teaching practicum.

Theoretical framework

The theoretical framework of this study is shown in Figure 1. The exogenous variables were the supporting factors which consisted of campus based course, school mentor support and pre-service teacher's self efficacy. The endogenous variables were the learning outcomes including instructional design skills, assessment strategies and managing learning activities. The research question of this study is:
What are the relationships between the supporting factors of the teaching practicum model and its learning outcomes?

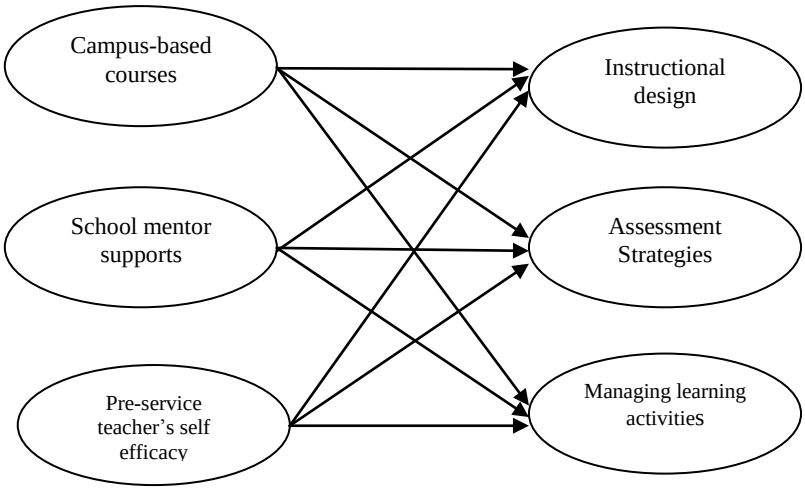

Figure 1 Theoretical Framework of this Study

Research Methodology

Participants

The pre-service teachers involved in the study were all in the four-year teacher education programme in one of the largest teacher education institutes in Hong Kong. The institution grants a B.Ed. degree for pre-school, primary school, and secondary school teachers. Teaching practice is the core course offered on all the B.Ed programmes at the institute. Ethical approval was granted by the ethics committee of the institute. All the participants gave informed consent. A self-response quantitative questionnaire survey was prepared in order to obtain feedback from the students on their teaching practice.

Research Design

A quasi-experimental research design was used in this study to evaluate the effectiveness of the teaching practicum and to determine the predictive relationship between the supporting factors and the learning outcomes of the teaching practicum.

Instrument

The questionnaire was based on a number of scales that were constructed to measure the variables. In order to develop valid items for these scales, the researcher conducted a content analysis of the teaching practicum outlines and group interviews with pre-services teachers from different major subjects. In the group interview, participant views regarding the two research questions, the learning outcome and the factors support their learning ion their teaching practicum, were collect. The learning process and the learning outcomes of the teaching practicum were then converted into statements for use in the questionnaire. The questionnaire contained 18 questions which were used to measure the exogenous and endogenous variables (see Table 1). Likert six-point scales were used in both sections to measure the variables. Likert scales are commonly used in attitudinal research. The Likert scale assumes that the difference between answering 'agree strongly' and 'agree' is the same as between answering 'agree' and 'neither agree nor disagree' (Likert, 1932).

Data collection

A self-response quantitative questionnaire survey was prepared in order to obtain feedback from the students on their teaching practices. There were 229 pre-service teachers responded to the survey. Participants were asked to answer questions on the effectiveness of the supporting factors and their learning outcomes from their teaching practice. The data was collected directly from the participants by means of the questionnaire.

Data Analysis

Exploratory factor analysis was done separately for the two sets of latent variables by principal factor axis analysis to confirm the constructed validity the instruments (see table 1). The study is interest in a theoretical solution uncontaminated by unique and error variability and it is designed with a framework on the basis of underlying constructs that are expected to produce sources on the observed variables. Principal axis factor (PAF) analysis, which aims to reveal the underlying factors which produce the correlation or correlation among a set of indictors with the assumption of an implicit underlying factor model, was applied to the items from the learning processes and learning outcomes separately. Promax rotation, a method of oblique rotation which assumes the resulting factors are correlated with one other, was applied to extract the factors. An eigenvalue greater than one was used to determine the appropriate number of factors for the factor solutions. A Structural Equation Model (SEM) was applied to examine the factor structures and the paths among the variables, using Lisrel 8.3 (Joreskog & Sorbom, 1999). SEM is a collection of statistical techniques that allows the examination of a set of relationships between Exogenous variables and Endogenous variables.

Findings

The results of exploratory factor analysis, presented in Table 1, clearly suggest two three-factor structures for both exogenous and endogenous variables that are both empirically feasible and theoretically acceptable. The reliability coefficients of the scales ranged from 0.68-0.93, which was judged adequate for this study. The results

of descriptive statistic show that the scale means of all the variables are higher than 4.11 within the 6 point-scale, this reflects that the participants tend to agree with all the items (See table 1).

Table 1. Results of the Exploratory Factor Analysis and Reliability Test for Each Scale

Scale		Factor 1	Factor 2	Factor 3
School mentor support	Q17	0.922		
	Q19	0.925		
	Q21	0.837		
Campus-based Courses	Q6		0.762	
	Q7		0.834	
	Q8		0.743	
Pre-service teacher self-efficacy	Q22			0.706
	Q23			0.777
	Q24			0.614
Eigenvalue		3.36	2.03	1.45
% of Variance Explained		37.30	22.58	16.15
Scale Reliability Cronbach's Alphas Coefficient		0.93	0.82	0.74
Scale Mean		4.67	4.11	4.90
Scale SD		3.21	2.56	1.73
Scale		Factor 4	Factor 5	Factor 6
Managing learning activities	Q44	0.694		
	Q45	0.766		
	Q47	0.646		
Assessment Strategies	Q37		0.671	
	Q38		0.787	
	Q39		0.622	
Instructional Design	Q28			0.552
	Q29			0.885
	Q30			0.466
Eigenvalue		3.31	1.44	1.14
% of Variance Explained		36.70	16.03	12.61
Scale Reliability Cronbach's Alphas Coefficient		0.74	0.75	0.68
Scale Mean		4.26	4.84	4.76
Scale SD		2.67	1.89	1.63

The structural and measurement coefficients from the completely standardised solution under maximum likelihood are presented in Figure 2. The goodness of fit statistics are shown in Table 2. The structural and measurement coefficients from the completely standardised solution under maximum likelihood are presented in Figure 1. The goodness of fit statistics are shown in Table 2. The structural equation model shows that the pre-service teacher's self-efficacy is the only predicative variable for all the learning outcomes: instructional design (γ = 0.73), assessment strategies (γ =0.72) and managing learning activities (γ =0.31). Campus-based course is a significant predicative variable for instructional design (γ = 0.20) and managing student learning activities (γ = 0.29). The school mentor support is a predicative variable for managing learning activities (γ = 0.22). All the paths in the model were significant at the 0.05 level according to the Z statistics.

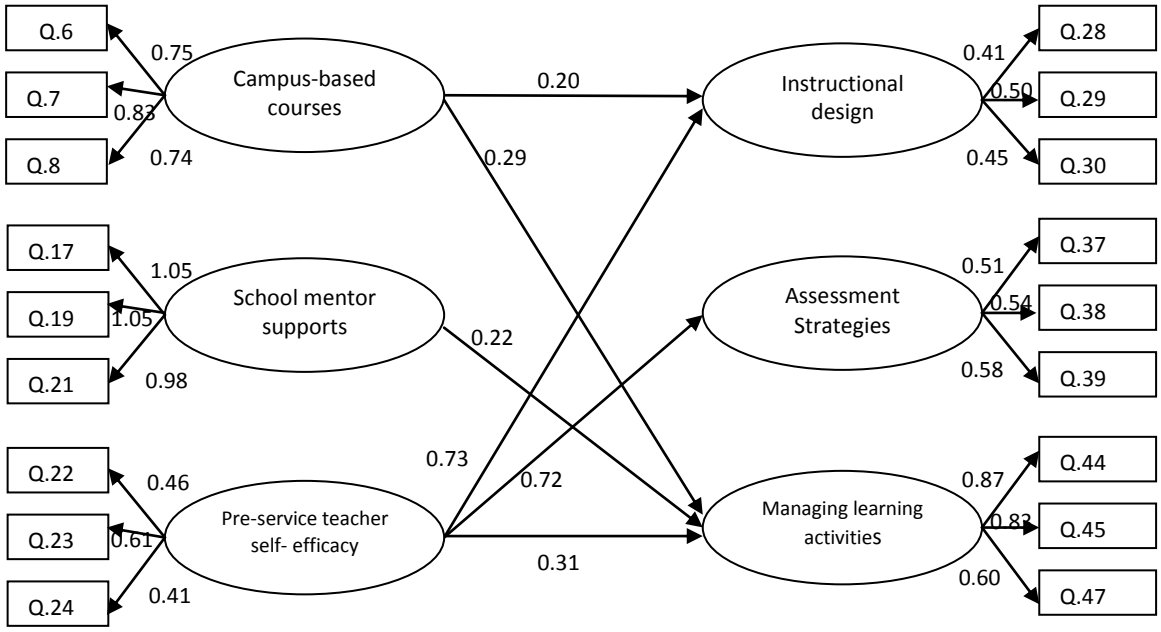

Figure 2. Structural model

Table 2 Goodness of Fit Statistics of the Structural Equation Model

χ^2	df	p-value	PGFI	RMSEA	SRMR	CFI	NNFI	IFI
146.11	123	0.076	0.67	0.029	0.049	0.99	0.98	0.99

The hypothesised model is a good fit to the data. The results of the LISREL based on 229 participants showed that the chi-square value was not significant for the overall model, χ^2 (N=229) = 146.11, P= 0.076. As an absolute fit index, the chi square assesses the discrepancy between the sample covariance matrix and the implied covariance matrix based on the hypothesised model. A non-significant chi-square suggests that the model may be a reasonable representation of the data. However, the assessment of fit using the chi-square test is confounded by sample size. When the sample size is large, the small difference between the sample covariance matrix and the reproduction covariance may be found to be significant.

The Parsimony Goodness-of Fit index (PGFI) takes into account the complexity of the hypothesized model in the assessment of overall model fit for addressing the

issue of parsimony in SEM. The PGFI should be larger than 0.5, with higher values indicting a more parsimonious fit (Mulaik, et al, 1989). Relative-fit index and residual based indexes are two types of additional fit indexes widely used to complement chi-square. Relative-fit indexes include comparative fit index (CFI), non-normed fit index (NNFI) and incremental fit index (IFI). These indexes measure the relative improvement in fit by comparing a hypothesised model with a base-line model. The base-line model is an independent model in which all variables are expected to be uncorrelated. These indexes range from zero to one, with larger values indicating a better fit. They should be at least larger than 0.9 for reasonable goodness of fit. In the present study, the indexes are: PGFI = 0.67, CFI = 0.99, NNFI = 0.98 and IFI = 0.99, suggesting a reasonable fit between the data and the hypothesised model.

In addition to relative-fit indexes, residual-based indexes can also be used. Standardised root mean square (SRMS) measures the average value across all standardised residuals between the elements of the observed and implied covariance matrices. Root mean square error of approximation (RMSEA) assesses the absence of fit owing to model misspecification and provides a measure of discrepancy per degree of freedom (Browne & Cudeck, 1993). SRMR ranges from zero to one and there is no upper limit for RMSEA, with smaller values indicating a better model fit. A value of 0.08 or less for SRMR and a value of 0.06 or less for RMSEA indicate an adequate fit (Hu & Bentler, 1999). In this study, SRMR = 0.049, whereas RMSEA = 0.029 (90% CI. 0.0; 0.045). Given that this is a very stringent model, these fit statistics indexes show that the model fits the data fairly well.

There are significant relationships among the independent variables of the models (see table 3). The correlation coefficient between pre-service teacher's self-efficacy and campus-based course is 0.36, between pre-service teacher's self-efficacy school mentor supports is 0.18. These findings suggest that the campus-based course, school mentor support and pre-service teacher's self-efficacy are correlated and mutually interdependent in terms of providing opportunities to enhance pre-service teachers' professional learning.

Table 3 Correlation Matrix of Independent Variables

Scale	Campus-based course	School mentor support	Pre-service teacher's self-efficacy
Campus-based course	1.00		
School mentor support	0.18*	1.00	
Pre-service teacher's self-efficacy	0.36*	0.32*	1.00

Discussion

The structural equation model (see Figure 2) explores the participants' perceptions of the supporting factors for the learning process and their learning outcomes in their teaching practice. The model clearly shows that both the variables of the three learning supporting factors and the three learning outcomes are empirically constructed into latent variables and co-exist in the model. The SEM shows that the teaching practicum model has an impact on most pre-service teachers in terms of helping to improve their instructional design, assessment strategies, and

management of learning activities. The participants tend to agree that their teaching practicum has an immediate impact in terms of helping them develop their instructional design, managing class activities and assessment skills effectively through attending campus-based lectures and tutorials, supporting from school mentors and developing their self-efficacy. This claim is supported by the results of the descriptive statistic (see Table 1). Results of the descriptive statistic also show that the participants have a positive response to the supporting factors.

The supporting factors, campus-based courses, school mentors support and their self-efficacy are correlated (see table 3) and mutually interdependent in terms of providing opportunities to enhance pre-service teachers' professional learning. This finding supports the claim that the supporting factors embedded in their teaching practices and its components are mutually interdependent. The teaching practicum model bridges the theory and practice gap by providing support to pre-service teachers.

Pre-service teachers' self-efficacy is the only predictive variable for all the learning outcomes. This finding suggests that their self-efficacy is the main and the critical factor that helps them master the skills required for instructional design, assessment strategies, and managing learning activities. This finding is consistent with Doyle's (1997) study, which indicated that the beliefs of pre-service teachers are related to their experience gained in teaching situations. Activating pre-service teachers' self-efficacy allows them to control their behaviour, thinking, and emotions to organize and execute the actions required to learn how to plan, implement, and evaluate a lesson.

A campus-based course is a significant predictive variable of the skills for instruction design and managing class activities. These findings suggest that participants of the campus-based courses learn the skills for instructional design and managing the class learning activities. Surprisingly, a campus-based course is not a significant predictor for assessment skills and its mean score (4.11) is the lowest among the three supporting factors. This finding is consistent with Plake's (1993) study, which suggests that pre-service teachers are not well prepared to assess student learning. The education practices of classroom assessment should be well presented and decomposed in the campus-based course (Stiggins, 1999).

School mentor support is a significant predictive variable for skills required for managing learning activities only. Unlike the campus course, the mentor support is not related to the learning outcomes for instructional design and assessment strategies. This finding is consistent with Feiman-Nemser's (1996) study, which identified mentoring as a mechanism for supporting teaching practice in knowing how to manage class learning activities according to the lesson plan. The school mentor has a great impact on the quality of the teaching practicum of pre-service teachers. Insufficient training for school mentors is therefore a serious challenge to creating consistent and optimal teaching practicum for pre-service teachers (Rodgers & Keil, 2007). A teacher education institute may consider building partnership with schools not only for the purpose of securing placements for teaching practice, but also to provide in-service training schools for school mentors. University professors and school mentors could work together in a team to discuss ways to build a scaffolding for pre-service teachers (Casy and Howson 1993). In this connection, enrolling school

mentors in mentoring training and in-service teacher training programmes is essential to the success of pre-service teaching practice.

Limitations of the Study

Several limitations of this study should be noted. It is important to note the limitations of the research design. The quality assurance mechanism of the institute and the course guide for teaching practicum have standardized the implementation of the course, there was no way for the researcher to set up control groups or provide a pretest to collect data for comparison. Therefore, the quasi-experimental design with no pre-test and no control group was adopted, this remained a limitation. Another important question concerns the generalizability of this study. Although the questionnaire appears to have content and constructed validity in addition to relatively high reliability, the fact that all of the pre-service teachers were from a single institute, the findings of this study may have limitations in generalizing to other populations. The final limitation concerns the predictive validity of the findings. While the data were collected from self report questionnaires which posited as evidence of instructional design, managing class activities and assessment skills, the researcher do not quite sure whether the participants perceived learning outcomes found in this study represent the actual long-lasting learning outcomes in their teaching career that can be transferred to other instructional situations.

Conclusion

This study presents findings on the evaluation of implementation of a teaching practicum in initial teacher education at one institute in Hong Kong. The results of the evaluation demonstrate that the teaching practicum model has an impact on most pre-service teachers in terms of helping to nurture their competency on instructional design, assessment strategies and managing learning activities. The model could bridges the theory and practice gap by presenting and decomposing the education practices through campus courses, school mentor supports, and activating pre-service teachers' self-efficacy for effective learning. This study recommends a set of guiding principles for teacher education institutes, including enhancing the quality of the campus course by injecting elements of assessment strategies, strengthening the university and school partnership for supporting teaching practicum, providing an in-service teacher training programme to school mentors, and activating pre-service teachers' self-efficacy to improve the quality of their initial teacher education training programmes. This study shows that the model does make a difference. If course providers for initial teacher education really want to improve the quality of pre-service teachers' learning, they should consider injecting the elements of the model into their programmes along with a theory-based procedural package.

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