

# Beginning teachers' perceptions of their levels of pedagogical knowledge and skills: did they change since their graduation from initial teacher preparation?

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**Abstract** This study investigated changes in beginning teachers' self-perceptions of their pedagogical knowledge and skills after their first year of teaching. Surveys were administered to 322 graduating student teachers at the end of the initial teacher preparation programme and at the end of their first year of teaching to compare if there were any differences in their self-perceptions. The results of the study showed significant increases in beginning teachers' perceptions of their pedagogical knowledge and skills in three factors: Instructional Support, Accommodating Diversity and Classroom Management. Results established the development of teachers to be an ongoing process that is initiated but not completed in initial teacher preparation. Implications of findings for induction and mentoring of beginning teachers are discussed.

**Keywords** Beginning teachers · Teacher education · Teacher induction · Mentoring · Pedagogical knowledge and skills

## Introduction

In the new millennium, one of the core issues in educational reform is the development of a highly qualified teaching force that would be prepared to meet the demands of the paradigm shifts in school education (Fullan 1998). In such an era of fast transformations, teachers as key actors in school education are expected to face up to numerous new expectations, challenges and uncertainties in the discharge of their professional duties of preparing their young charges for success in the new century (McGhan 2002; Wheatley 2002). International research has identified clearly the impact of teachers on the learning of young people (Hattie 2002; Hopkins 2001). The question is often raised about how adequately teacher education has empowered teachers to take up the new roles and effectively perform teaching to meet the challenges raised from educational reforms. How do teacher education practices echo these trends and provide sufficient and appropriate support to facilitate changes in teaching and learning and enhance education effectiveness and relevance to the future? This becomes a core concern for development in teacher education design and delivery. What are the perceptions on essential knowledge and skills in initial teacher education? How much is developed in the beginning years of practice? What more salient professional development needs do our teachers have? These are the critical concerns and challenges that have consequently drawn refreshed attention on teacher education (Darling-Hammond et al.

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2005; Goodlad 1999). It is with these concerns in mind that this study was embarked on.

## Literature review

Teacher education is also seen to provide the professional knowledge base to facilitate the development of an understanding of learners and how they are to be taught (Berliner 2001). It is clear that programmes of initial teacher education are the critical first steps in the professional journey that requires the right conditions to support teacher development, but “very little” (p. 6) as Cochran-Smith (2005) summarizes, is really known about the efficacy of teacher education programmes and the links to actual practice in the schools. The literature continues to call for research and evidence of transfer of skills and knowledge in schools (Fallon 2006; Schalock et al. 2006).

### Learning to teach

Some learning-to-teach studies (Kagan 2002; Kane and Russell 2003) have tried, using qualitative data, to explain how beginning teachers develop and undergo changes as they become teachers. Kane and Russell (2003) described the first years of teaching as the “survival stage” of teacher development, with beginning teachers continuing to develop their skills and knowledge well into their first few years of teaching.

In an attempt to consolidate and present the evolution of professional teaching skills, Kagan (2002) reviewed 40 learning-to-teach studies, and highlighted some other developmental models that were based on empirical research. These studies looked into the teacher’s concerns (Kane and Russell 2003), compared novice and expert teachers (Berliner 1988), and introduced the schema theory (Anderson 1984). More recent works focused on the development of teachers into “adaptive experts” (Hammerness et al. 2005). According to Hammerness et al. (2005), expertise existed on two dimensions—efficiency and innovation. They described the expert teacher as someone who was able to “perform particular tasks without having to devote too many additional resources to achieve them” and at the same time able to “rethink key ideas, practices, and even values to respond to novel situations” (pp. 358–359).

Feiman-Nemser’s (2001) conception of a professional learning continuum, on the other hand, focuses on the central tasks of learning-to-teach in the preservice, induction, and continued professional development phases. Student teachers’ tasks in preservice include: analysing behaviours to form new visions, developing subject matter knowledge, developing their understanding of learners and learning, developing a beginning repertoire, and developing the tools

to study teaching. Beginning teachers build on their teacher preparation experiences, learn the context of their work, design responsive instructional programmes, create classroom communities, enact a beginning repertoire, and then develop a professional identity.

### The beginning teacher experience

Research from learning to teach suggests that beginning teachers face a number of challenges as soon as they enter the schools. Studies show that they are overwhelmed and liken the traumatic first-year experience to being a “sink or swim” experience (Varah et al. 1986). Research by Valli (1992) and Wilson et al. (1997) show that the challenges, problems and concerns that beginning teachers face are rather universal. Beginning teachers feel inadequate about some core knowledge and skill competencies. They feel inadequate about their lack of understanding of the students they teach (Schempp et al. 1998). They have difficulties trying to cater to their students’ diverse learning needs (Bullough and Stokes 1994; Grudnoff and Tuck 2001). They are overwhelmed by non-teaching duties, classroom management concerns (Grudnoff and Tuck 2001), lack of curriculum knowledge (Parkinson and Rea 1999), and disruptive and unmotivated students (Featherstone 1993; Fisher et al. 1999).

Compounding these challenges is the observation that beginning teachers tend to be concerned more about the way they are perceived by parents, administrators and colleagues in comparison to experienced teachers (Varah et al. 1986). Social and professional isolation is a widely experienced reality as beginning teachers are reluctant to ask for help (Featherstone 1993). The beginning teacher experience is further made more complicated when they face unresponsive administrators and uncooperative parents (Serow et al. 1994). These findings provide a sense of the professional concerns and struggles of our beginning teachers, and point to an urgency to address some of these concerns.

The quality of a teacher’s experience in the initial years of teaching is critical to forming positive attitudes to teaching as a career (Bezzina 2006). Perceptions of inadequacies in knowledge and skills may develop into the sense of disappointment and powerlessness reported by novice teachers (Elliot and Sinlarat 1999). As Bezzina (2006) described it, the “transition shock” caused by the beginning teachers’ realization about the discrepancy of the real world of teaching and the feeling of lack of preparation for many of the demands that teaching brings can lead to a state of paralysis that renders teachers unable to transfer to the classroom the skills they learned during teacher education. As a result, many beginning teachers become disillusioned, frustrated, lost and start doubting their career

choice and choose even to leave the teaching profession early (Delgado 1999). Halford (1998) went as far to claim that teaching is a "...profession that eats its young" (p. 33). The challenge is how to induct beginning teachers into the real world of their work in a way that promotes a high level of professional practice and competencies.

#### Induction and professional development for beginning teachers

There is growing evidence that induction programmes and various forms of mentoring programmes can provide the needed support system to help beginning teachers acquire the knowledge and skill competencies of more experienced teachers more thoroughly, be socialized into the culture of school more quickly, and be more satisfied with their work (Darling-Hammond 1995; Gold 1996; Huling-Austin 1992).

An international study by the United States Department of Education, the Educational Forum of APEC (Asia-Pacific Economic Cooperation) and the Pelavin Research Institute (Moskowitz and Stephens 1997) examined the features of induction programmes across 11 APEC countries (Australia, Brunei Darussalam, Canada, India, Japan, Korea, New Zealand, Papua New Guinea, Singapore, Chinese Taipei, and the United States). They observed that although induction programmes tended to be rooted in the unique cultures of the country in which they are established, and employ a wide range of delivery systems and strategies, successful induction programmes have several characteristics in common, namely:

- providing lighter teaching loads for beginning teachers,
- having well-defined mentoring programmes,
- providing time for new teachers to observe experienced teachers and encourage their constant interactions,
- providing one-week to one-month orientations which include networking among teachers and short timely in-service workshops,
- downplaying assessment and emphasizing assistance and support,
- having a culture of shared responsibility in teacher induction, and
- having high political, financial and time commitments.

The research literature is consistent as to the effectiveness of well-planned induction and structured mentoring programmes (Awaya et al. 2003). Induction programmes are recommended not to be seen as the be-all and end-all to solving beginning teacher challenges. Induction studies (Feiman-Nemser 1996; Feiman-Nemser et al. 1993) have made the observation that we need to be cautious about the use of mentors in induction programmes as mentors tend to promote conventional practice. There are also mentors who

impede, rather than stimulate, beginning teachers' professional growth (Fairbanks et al. 2000).

#### Background

The National Institute of Education (NIE) is the sole teacher education provider in Singapore and offers three different initial teacher preparation programmes: the Diploma in Education (Dip Ed), the Bachelor of Arts (Education) and Bachelor of Science (Education), and the Postgraduate Diploma in Education (PGDE) (Primary/Secondary) programmes. The targeted population of this study is from the Postgraduate Diploma in Education (PGDE) (Primary/Secondary) programme (Wong et al. 2008). It is a one-year programme designed for graduates with a baccalaureate degree from local or recognized foreign universities to prepare them for either teaching at primary or secondary schools in Singapore.

The PGDE programme requires student teachers to read courses in two major subject groups, namely, Education Studies and Curriculum Studies. In addition, all of them must undergo a 10-week Teaching Practice in their final semester.

After graduation, the beginning teachers continue to extend their knowledge and hone their teaching skills via the Structured Mentoring Programme (SMP). The SMP is a systemic framework for school-based mentoring induction, which was launched by Singapore's Ministry of Education in 2005. The SMP framework consists of three dimensions: *Ministry of Education—Headquarters* (MOE-HQ) Induction, *School-level Mentoring*, and the *Beginning Teachers' Learning Programme*. Most schools in Singapore already have some form of an induction programme for beginning teachers. The SMP expanded and added two additional dimensions: *Induction at MOE-HQ* and the *Beginning Teachers' Learning Programme*. The induction programme is organized by MOE-HQ for beginning teachers before they report to school. During this session, experienced educators are invited to address the beginning teachers. They are also informed about MOE's vision, policies and personnel issues.

For the second dimension, *School-level Mentoring*, the SMP framework provides different mentoring structures. There are three formalized mentor roles defined in the SMP:

1. *Mentor*: Experienced or Senior Teacher<sup>1</sup> assigned to look after the well being, skills development and professional growth of beginning teachers.

<sup>1</sup> A Senior Teacher is a key appointment holder in the school system. A teacher who has been promoted to this rank would have had many years of experience, are recognised for their outstanding ability as classroom teachers and mentors to young teachers, and act as leaders in pedagogy within their schools.

2. *Mentor (Specialized)*: This role is like that of a specialist coach to help beginning teachers develop work skills and acquire knowledge in a specific area (e.g., counselling) or teaching subject areas.
3. *Mentor Coordinator*: This is the leader and driver of the school-level mentoring programme, usually assumed by a Head of Department. They prepare the mentors for their roles by giving physical, social and emotional support, acting as mentors for mentors. Mentor Coordinators perform the strategic role of staff developers who are responsible for the careful planning of the school-level mentoring programme.

The third dimension, the Beginning Teachers' Learning Programme, comprises four courses—Basic Counselling, Reflective Practice, Classroom Management, and Assessment. Beginning teachers need to complete these courses within the first two years of their teaching.

Given that the growing literature emphasizes the importance of induction and help being provided to beginning teachers, this study is timely. The present study recognizes that the first year is a critical period in the beginning teachers' lives, as the outcome of the transition between the initial teacher preparation and the real world of work may determine the teachers' abilities and attitudes throughout their career. Having a perspective about learning to teach is important. First, it identifies what mentors should do in the early years of induction, and how these may change as beginning teachers' needs and concerns change. Secondly, if professional development is provided to the beginning teacher, an explicit perspective about their skills and knowledge and their needs would be useful when identifying topics that would be most salient to beginning teachers during the different induction periods.

## Methodology

The sample comprised 322 student teachers in the Primary and Secondary tracks of the Post Graduate Diploma in Education (PGDE) initial teacher preparation programme (ITP). The age range of the participants was between 22 and 43 years.

This paper reports the findings of a part of a longitudinal study. A survey questionnaire eliciting the student teachers' perceptions of their level of knowledge and skills in teaching was developed by the research team based on the research literature in the area of teacher education. It was administered at three data points: commencement of the ITP programme, graduation from the programme, and at the end of their first year of teaching. The survey instrument comprised 50 questions. Each question had two 5-point Likert rating scales, one to measure the student

**Table 1** Five-point Likert scale of self-perceived level of pedagogical knowledge and skills

Perceptions of knowledge level	Perceptions of skills level
5. Highly knowledgeable	5. Extremely confident
4. Knowledgeable	4. Confident
3. Uncertain	3. Uncertain
2. Not so knowledgeable	2. Not so certain
1. No knowledge at all	1. No confidence at all

teachers' perceptions of their knowledge level of what teaching is about and the second to measure their perceptions of their current skills level in teaching. The Likert scale used to assess the self-perceived levels of knowledge and skills is given in Table 1.

For the purpose of this paper, only the responses for the 38 survey items pertaining to the beginning teachers' perceptions of knowledge and skills at the point of graduating from the programme and at the end of their first year of teaching were extracted for the data analyses.

## Research questions

The purpose of this paper is to examine if there are differences in the way the PGDE student teachers perceived their pedagogical knowledge and skills at the end of their one-year initial teacher preparation (ITP) and at the end of their first year of teaching. This study therefore seeks to answer the following questions:

1. How do beginning teachers perceive their pedagogical knowledge and skills at the end of their initial teacher preparation?
2. How do beginning teachers perceive their pedagogical knowledge and skills at the end of their first year of teaching?
3. What is the extent of change, if any, in their perceptions of their pedagogical knowledge and skills after teaching in school for one year?

The survey data collected at the exit of initial teacher preparation and at the end of first year of teaching were used as the main sources of data to answer the research questions.

## Data analysis and results

Factor analysis was used to extract factors from the 38 out of a total of 50 items in the survey. Using Principal Component Analysis with Varimax rotation, six factors with eigenvalues above 1.2 were extracted from 38 items

and four items were dropped from the analysis. The six factors were:

1. Student Learning
2. Lesson Planning
3. Instructional Support
4. Accommodating Diversity
5. Classroom Management
6. Non-teaching Duties

The Cronbach alpha was used to estimate the reliability of each factor extracted from the factor analyses. Nunnally (1978) indicated that 0.70 to be an acceptable reliability coefficient for social studies research. The Cronbach alpha of the survey was 0.95, which showed that the data collection instrument was reliable. Follow-up analyses also showed that all factors were reliable, with Cronbach alphas ranging from 0.71 to 0.83. The descriptors of the factors, selected items in each factor as well as their Cronbach alphas are shown in Table 2.

Multiple analysis of variance (MANOVA) was conducted to compare the overall differences in perceptions of knowledge and skills between the completion of their initial teacher preparation programme and the end of their first year of teaching. Wilks' Lambda value and *t*-tests were conducted to compare the means of the beginning teachers' perceptions of knowledge and skills. MANOVA was used before the *t*-tests to prevent Type I Errors.

The data analysis results in Table 3 showed that the differences in their perceptions of knowledge between the

end of initial teacher preparation and first year of teaching was significant (Wilks' Lambda = 5.75, *p*-value < 0.05). Further *t*-tests showed significant increases in three out of the six factors after one year of teaching. These factors were as follows: Instructional Support, Accommodating Diversity and Classroom Management. Factor three, Instructional Support, increased from 3.75 to 3.80 (*t* = 4.35, *p*-value < 0.05); Factor four, Accommodating Diversity, increased from 3.56 to 3.63 (*t* = 5.74, *p*-value < 0.05); and Factor five, Classroom Management, increased from 3.51 to 3.63 (*t* = 17.12, *p*-value < 0.05).

Comparisons of means in perceptions of their skills levels showed similar results as the change in their knowledge levels. MANOVA results showed that there were significant differences in their perceptions of skills (Wilks' Lambda = 3.77, *p*-value < 0.05). *T*-tests' results as given in Table 4 showed that there were significant differences in four out of six factors. They were: Lesson Planning, Instructional Support, Accommodating Diversity and Classroom Management. All four factors increased significantly in perceived skills after the first year of teaching. Factor two, Lesson Planning, did not show significant difference in perceptions of knowledge. However, the beginning teachers reported that their perceptions of skills level in Lesson Planning increased significantly after one year of teaching. This factor increased from 3.57 to 3.63 (*t* = 5.53, *p*-value < 0.05). Factor three, Instructional Support, increased significantly from 3.71 to 3.78 (*t* = 8.19, *p*-value < 0.05); Factor four,

**Table 2** Sample items of factors and reliabilities

Factor	Factor description	Sample items	Cronbach Alpha
1 Student learning	Facilitating students' thinking and learning	<ul style="list-style-type: none"> <li>• Infusing critical thinking appropriately into the lessons</li> <li>• Facilitating and stimulating thinking among students</li> </ul>	0.83
2 Lesson planning	Planning lessons using appropriate strategies to meet students' needs	<ul style="list-style-type: none"> <li>• Choosing appropriate teaching strategies for teaching particular topics</li> <li>• Planning lessons that take into consideration the different abilities of students</li> </ul>	0.82
3 Instructional support	Selecting appropriate resources and assessment modes to support instruction	<ul style="list-style-type: none"> <li>• Acquiring appropriate teaching materials for my lessons</li> <li>• Using appropriate forms of assessment</li> </ul>	0.77
4 Accommodating diversity	Catering to students' different needs	<ul style="list-style-type: none"> <li>• Responding sensitively to different student needs</li> <li>• Using evaluative feedback to assist students in their progress</li> </ul>	0.71
5 Classroom management	Managing student behaviours and discipline	<ul style="list-style-type: none"> <li>• Managing students with behavioural and learning problems</li> <li>• Using appropriate strategies to monitor student behaviour</li> </ul>	0.80
6 Non-teaching duties	Providing for the holistic development of students	<ul style="list-style-type: none"> <li>• Showing concern for the holistic development of students</li> <li>• Managing Co-curricular activities</li> </ul>	0.81

**Table 3** Perceptions of knowledge at graduation and after their first-year teaching

Factors	End of ITP	After one year of teaching	<i>T</i>	Difference (One year—End of ITP)
MANOVA			Wilks' Lambda = 5.75*	
Student learning	3.66	3.64	0.726	−0.02
Lesson planning	3.68	3.72	1.96	0.04
Instructional support	3.75	3.80	4.35*	0.05
Accommodating diversity	3.56	3.63	5.74*	0.07
Classroom management	3.51	3.63	17.12*	0.12
Non-teaching duties	3.70	3.74	2.23	0.04

\* *p*-value < 0.05 level**Table 4** Perceptions of skills at graduation and after their first-year teaching

Factors	End of ITP	After one year of teaching	<i>T</i>	Difference (One year—End of ITP)
MANOVA			Wilks' Lambda = 3.77*	
Student learning	3.53	3.57	1.43	0.04
Lesson planning	3.57	3.63	5.53*	0.06
Instructional support	3.71	3.78	8.19*	0.07
Accommodating diversity	3.54	3.61	6.37*	0.07
Classroom management	3.33	3.50	18.38*	0.17
Other non-teaching	3.63	3.69	3.45	0.06

\* *p*-value < 0.05 level

Accommodating Diversity, increased from 3.54 to 3.61 ( $t = 6.37$ ,  $p$ -value < 0.05); and Factor five, Classroom Management, increased from 3.33 to 3.50 ( $t = 18.38$ ,  $p$ -value < 0.05).

## Discussion

Findings indicated that there were significant increases in three of the six factors in their perception of knowledge and four out of the six factors in their perception of their skills after 1 year of teaching. The three common factors for both pedagogical knowledge and skills were: Instructional Support, Accommodating Diversity and Classroom Management. The extra factor which showed an increase for their perception of skills is Lesson Planning. Since there were some areas that did not display increases, it could mean that the first-year teachers' responses suggest that becoming a teacher is an ongoing process that is initiated but not completed in the formal initial teacher preparation programme. This finding supports what was mentioned earlier in this paper, that the first years of teaching are described as the "survival stage" of teacher development, with beginning teachers developing along a continuum of skills, knowledge, and abilities well into their first years of teaching (Kane and Russell 2003).

There are various possible reasons for the increase in both the pedagogical knowledge and skills in Instructional Support, Accommodating Diversity and Classroom Management as well as increase in fourth skill factor of Lesson Planning in the first year of teaching. The first year brings a shift in role orientation and an epistemological move from formal study to confronting the day-to-day challenges (Feiman-Nemser 2001). The research also indicated that as student teachers move from student teaching to becoming a full fledged beginning teacher of students, they move from a "knowing about teaching perspective" to a "knowing how to teach" outlook. They focus their attention on the process and accomplishments of teaching and the ways of transferring information to students. Issues of efficiency, organizing, and managing are foremost in their minds (Hartzler-Miller 2002). The perceptions of their knowledge and skills in teaching and learning become more specific as they transfer what they learned during their initial teacher education to the classroom. Designing lesson plans and providing instructional support take on concrete perspectives as they learned to accommodate the diversity of the students that are put under their charge. First-year teachers indeed have a lot to learn as they put their content knowledge and theory into practice within the classroom.

During the first year, beginning teachers are focused on themselves as teachers rather than the student learning or

other non-teaching duties (the two factors that did not show any significant increase). This can be explained by what Gilles et al. (2001) described as the three stages of concerns that teachers go through during their induction period. The first stage, the survival stage, is when beginning teachers struggle with personal and professional competence. Their apprehensions include ineffective classroom management, peer acceptance, and doubt of their teaching capabilities. In the next stage called the mastery stage, beginning teachers' concerns are more situational and include skill mastery, teaching methods, and classroom resources. In the final stage, the impact stage, the concerns shift fully to how they are affecting their students. Many of the first-year teachers are more likely to be in the first and maybe second stage rather than the final stage of concerns. This could explain why the beginning teachers in this study did not seem to perceive a significant increase in level in the areas relating to student learning and non-teaching duties, such as showing concern for students, at the end of their first year of teaching.

Another possible reason is the implementation of the Structured Mentoring Programme (SMP) which was described earlier in this paper. The first dimension of SMP, Induction at the MOE-HQ, provides a one-week formal teacher induction programme which can be framed as a transition from initial teacher preparation to actual teaching practice, from student teaching to a beginning teacher of students. The PGDE programmes in NIE provided beginning teachers the foundational knowledge as well as an understanding of the key concepts and principles of teaching and learning while the formal Induction at MOE-HQ brings a shift in role orientation for the first-year teacher.

As the second dimension of the SMP, school-level mentoring provides ongoing assistance to beginning teachers. The mentoring programme is designed with the objectives of improving both the professional as well as the personal development of beginning teachers. It has been in place for these first-year teachers providing further honing of their pedagogical knowledge and skills in areas such as instruction and classroom management. Links between theory and practice are formed in a reciprocal learning relationship between mentor and novice teacher and strong evidence suggests that mentoring improves the practice of both as a long-term outcome (Weiss and Weiss 1999). The Beginning Teachers' Learning Programme, the third dimension of the SMP, suggests that while some of the pedagogical knowledge and skills are covered in initial teacher education courses, a deeper understanding of issues can only occur after novices take on responsibilities as classroom teachers. Hence the school-level mentoring together with the Beginning Teachers' Learning Programme

could have resulted in the beginning teachers perceiving an increase in the level of their pedagogical knowledge and skills especially in the areas of Instructional Support, Accommodating Diversity and Classroom Management.

A beginning teacher induction programme is not only used to support novice teachers to make the all important transition from campus to school and to facilitate their enculturation into the teaching profession, it is also believed to be able to address problems, such as low recruitment, high teacher turnover and theory–practice links between initial teacher education curriculum and school reforms (Britton et al. 2003; Darling-Hammond 1999). Located in between initial teacher preparation and in-service professional development, the SMP constitutes a unique phase within the continuum of a teaching career.

Singapore's Structured Mentoring Programme (SMP) for beginning teachers is still relatively young. A comprehensive induction system demands the well-coordinated efforts of multiple and complementary providers with articulated roles and purposes. Schools need to be organized in ways that integrate teachers' learning from daily practice into a comprehensive change process that deals with impediments to and facilitators of student learning. Teachers who are formally initiated into the profession stand a better chance of developing norms that encourage self-perpetuating growth, are more likely to develop better commitment to teaching, and possibly resulting in a higher retention in the profession.

## Conclusion

The findings from this study support the view that teacher preparation is no static process. Feiman-Nemser (2001) wrote about what a professional learning continuum from initial preparation through the early years of teaching could be like. One of the questions addressed was: what are the central tasks of teacher learning in the early stages of learning to teach? This question prompts the consideration of the learning needs of beginning teachers at different stages in their learning to teach over time. The notion of "central tasks" suggests that each phase in the continuum of beginning teachers' learning has a unique agenda shaped by the requirements of good teaching and by where the beginning teachers are in their professional development. Furthermore, delineating central tasks of initial teacher education, induction, and early professional development allows us to see the challenges associated with the different stages. These necessary threads of continuity create a coherent and powerful curriculum for becoming a lifelong learning teacher and an agent of change in schools.

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