A Coaching System to Improve Mathematics Achievement through Development of Teacher Competencies

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ABSTRACT

The modern era brings with it increasingly rapid advancements to which societies must adapt. Educational institutions worldwide face great competition and must accept the necessity to adapt and develop in order to meet current standards and needs. Thailand finds itself lagging behind not only western educational systems but also those of its Asian neighbors, many of which have achieved great success on the international stage. Much effort had been directed toward reforming the Thai educational system, but thus far very little progress has been made as these efforts largely fail to address the tendency to dogmatically defer to antiquated, rote philosophies and pedagogy. Customary to the country's professional development of teachers are myriad short-term and one-shot activities lacking in necessary long-term vision and follow-up. More in-depth means of professional development, such as coaching, have not been widespread in their implementation. However, this is not due to any inherent failing in these processes but rather in the perception that they are difficult, or even impossible, to sustainably put into practice. Given a properly designed and, more importantly, properly supported system, coaching can indeed be a means through which institutions can strengthen the direct conduit through which they develop successful students and attain desired standards of performance and achievement, their teachers. Mathematics is regarded as a gateway towards understanding abstract concepts and critical thinking, skills valuable in mastering a number of subjects. Therefore, an effective coaching system coupled with a focus on mathematics can enable teachers to guide students to become more proficient learners. Using such a system, Bangpleepattanasuksalai School in Samutprakan, Thailand, was able to foster notable student achievement in mathematics by devising and putting into practice a coaching system to improve instructional practices and maintain high standards by developing its teachers' competencies.

Keywords: coaching, competencies, education, mathematics, professional development, teachers

INTRODUCTION

The world has transformed into a digital one. Aims and values in education have also shifted accordingly, wherein information itself is not as valuable as the ability to find, process and utilize said information. As such, it is clear that education in Thailand can no longer lean upon memorization and rote learning and that Thai teachers can no longer take it for granted that simply giving students information will lead to success in the real world. This approach fails to engage students' interests and therefore also fails to motivate them to think and reflect about what they are learning, and it is crucial that teachers adopt new approaches and practices (Thailand Development Research Institute, 2012).

The Importance of Mathematics Proficiency

In order to cultivate their students' ability to think for themselves, teachers must guide them to develop skills in reasoning, planning, analysis and decision-making. Students must not only have knowledge of facts but be able to identify problems and devise their own solutions to them as they will eventually enter a world that will consistently present them with new problems to solve. These are skills and abilities are reinforced by mathematical understanding and practice (Makanong, 2010). Because it bolsters creative and critical thought, mathematical proficiency can also lead greater comprehension of other fields (Jareeyawittiyanon & Sriwattanatumma, 1990) so it logically follows that adding focus on students' mathematical skills has great potential to benefit learning in other subjects as well.

The Benefits of Coaching

The improvement of students' mathematical proficiency not be attainable without development of teachers' competencies in regard to both subject matter and teaching practices. Professional development in Thailand has traditionally consisted of sporadic seminars and workshops catering to transient educational trends. These measures pay lip-service to the need to continually develop teachers' knowledge and skillsets but, being one-shot exercises, lack the time and depth necessary to allow teachers to properly ingest and try out new ideas and concepts, to practice trial and error, to effectively master new competencies. Processes such as coaching, on the other hand, are far more effective because of their ongoing nature and can provide teachers with a continuous support system (Knight, 2007). Coaching provides such support to coachees, the teachers needing to be coached, by giving them access to coaches, who are more expert or experienced parties. Unlike simple mentoring, however, coaching is a more focused process which addresses specific issues with set goals to be met within set timeframes. Not only practices but efficacies also are enhanced through the establishment of the coach-coachee relationship (Lord, Atkinson & Mitchell, 2008).

Coaching is not simply thrust upon teachers but is rather tailored to the needs of the coachee, giving them an opportunity for input into the process and starting them on the path to understanding their roles and becoming an equally capable peer to their more accomplished coaches (Robbins, 1991). The coaching process is not one that promises instant results, and as in athletic coaching proficiency takes time. This is not a detriment, however, as this gradual adoption of skills fosters greater retention and proficiency (Joyce & Showers, 1982). Precedents for the effectiveness of coaching as a means to induct and develop quality teachers exist worldwide in a number of well-regarded educational systems (Darling-Hammond & Rothman, 2011) and in close neighbors such as Singapore, where students' high mathematical standard is the result of intensive teacher training (Cavendish, 2015).

THE COACHING SYSTEM

Recognizing the importance of mathematics as an entry point for reason and critical thinking, Bangpleepattanasuksalai School, a private school in Samutprakan, Thailand, serving students in pre-Kindergarten, Kindergarten and Primary levels, designed a coaching system to meet specific needs, namely the development of teacher competencies in the instruction of mathematics to better engage students and cultivate their understanding and mastery of the subject. The Bangpleepattansuksalai coaching system is divided into two distinct and concurrent components, with preparation and implementation being supported by constant management on the part of the administration.

Preparation and Implemetation

The first stage, preparation, began with the identification of areas needing improvement and the determination of skills needing to be addressed through coaching. All potential stakeholders were then apprised of the aims and parameters of the coaching process. Then the search for qualified coaches began. For the coaching system, Bangpleepattanasuksalai School sought coaches having both extensive expertise in teaching practices who were also able to work in a collaborative, open-minded and nonjudgmental manner (Chien, 2013). As it was important to find coaches with experience in the same subjects and levels taught as the coachees (Birman, Desimone, Porter & Garet, 2000), the search was difficult given the small size of the pool of available candidates in Thailand, but eventually acceptable coaches were discovered. With stakeholders in place, agreement was reached in the definitions of roles and responsibilities.

With preparations made, the practical coaching process began. Coaches were paired with coachees and both parties formally met to evaluate the coachees' competencies through discussion, observation and demonstration. Issues determined to be focused upon included communication, use of instructional media and evaluation techniques. As the coaches' other professional responsibilities placed a constraint on their ability to physically be on-site at Bangpleepattanasuksalai School on an everyday basis, the school administration saw a need to rectify this situation because access to coaches was critical to the success of the entire coaching process. As previously contrasted with short-term off-site training exercises, a key component of coaching is coaches' ability to provide ongoing support (Chien, 2013). As a solution, the administration made full use of technology to counter the lack of physical presence with a virtual presence. While coaches still visited the school for regularly scheduled meetings as they were available, recordings of coachees' classroom instruction and frequent online communication for feedback and consultation were made to be essential parts of the coaching process.

Management and Results

This support and managerial attention from the administration is part of the key administrative component of the Bangpleepattanasukaslai coaching system, which does not follow the preparation and implementation stages but runs simultaneously with these stages to oversee the process and ensure its successful operation. As a motivation for optimal performance on the part of all stakeholders, it is necessary for the administration to demonstrate dedication to the coaching process (Garmston, 1987) and convince teachers of its importance as a supportive and not punitive measure (Knight, 2009).

The coachees' response to coaching was overwhelmingly positive, as any initial doubts gave way to enthusiasm as the coachees saw the benefits of learning from the coaches' experience. The resulting improvement in student performance was confirmed by gains in standardized test scores as well as awards from competitions both domestic and international and the process proved sustainable as these accomplishments continued into successive academic years with successful coachees graduating to become coaches to the school's other teachers.

DISCUSSION

Thai schools have found difficulty in obtaining favorable outcomes due to the difficulty in procuring qualified coaches and maintaining a consistent coaching process. Obstructions exist with the educational system in resources and especially time and while attempts have been made, many coaching initiatives become abandoned if taken upon at all.

The two pivotal elements of the success of the Bangpleepattanasuksalai coaching system lie in the administration's commitment to coaching and the innovative introduction of virtual interaction between coaches and coachees as a response to the experts' limited physical availability as on-site coaches. School administrators recognized coaching as their best avenue toward both institutional and student achievement and provided consistent physical, financial and emotional support. Most importantly, collaborative relationships were strengthened despite limited physical contact. Embracing communicative norms of the 21st century turned a constraint into an advantage as virtual communication not only accounted for restricted contact between coaches and coachees but in fact surpassed physical meetings by not being itself constrained by school or work hours. This innovation and the design and execution of the coaching system itself earned Banpleepattanasuksalai School recognition as a recipient of Thailand's One School, One Innovation Award in 2019.

CONCLUSION

Teachers need structured and ongoing systems for professional development. As a means to develop teachers and consequently better teach students, coaching has clear benefits but needs the appropriate support and modifications to flourish within the specific environments of individual organizations. With enough dedication, it is possible for Thai schools to implement coaching systems to improve the country's standard of education.

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