Monitoring Affective and Motivational Aspects of Learning Experience with the 
*Subtle Stone*

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Abstract—Providing students with timely and meaningful feedback is an important part of the learning process. In providing formative feedback, it is important that the teacher take the full complexity of the student into account, examining not only what the student learned or failed to learn but also why. There are numerous factors that are associated with why students did learn or fail to learn, and affective and motivational factors are considered especially important. However, these factors are often difficult for teachers to assess in the classroom, and as such can be overlooked in efforts to promote student success.

The purpose of this paper is to discuss the need for formative assessments that take affective and motivational factors into consideration. In doing so we introduce a non-commercial tool, the *Subtle Stone*, that can be integrated into the classroom to make the affective and motivational experience of students more readily available to teachers. We seek to explore whether the addition of such a tool to the classroom can enable teachers to take account of the holistic experience of students in their formative assessment activities.

Keywords—motivation; emotions; formative feedback; subtle stone

I. INTRODUCTION

In this short position paper we seek to contribute to the workshop theme “ecological monitoring of complex educational experience and feedback.” Specifically, we are concerned with how teachers can provide students with timely and meaningful feedback [1], that takes account, not only of what students learned or failed to learn but also why. There are numerous factors that are associated with why students did learn or fail to learn. “Affective, motivational factors” are considered especially important for the traditionally underrepresented and disadvantaged students’ mathematics learning [2, p. xix]. However, these factors are generally overlooked in efforts to promote student success [3].

In this paper we discuss how formative assessments might take affective and motivational factors through the application of a non-commercial tool known as the *Subtle Stone*.

II. ROLE OF AFFECT AND MOTIVATION IN LEARNING AND FORMATIVE FEEDBACK

It is important that teachers include such aspects in their formative assessment.

Mathematical discourse can be used as a formative assessment method in the classroom and it can include communications about affective aspects in addition to proofs, problem solving approaches, and so forth [13]. Nonetheless, mathematical discourse in middle school class does not necessarily include emotional and motivational experiences, partly because teachers can find it hard to know how students are feeling at any given time [14]. Additionally, adolescents tend to worry about how they are perceived by others. As such, a tool that protects students’ privacy but allows them to freely express their experiences with emotions and motivation in real-time would allow teachers to diagnose why students did or did not learn. In our proposed study, we plan to explore the extent to which the *Subtle Stone* can support teachers in giving formative assessment to students that takes account of the students’ affective and motivational processes.