A Review of Effective Teaching Practices in Secondary Education

Establishing the Evidence Base for the Teach Secondary Classroom Observation Tool

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Abstract

This evidence review presents a framework for understanding and measuring the quality of secondary teaching within low- and middle-income (LMIC) contexts. Additionally, it aims to justify this framework through the provision of a systematized evidence-base on effective secondary teaching practices as reflected through Teach Secondary tool, with a particular emphasis on research examples from LMIC contexts. It is hoped that the provision of an organizing framework for understanding both process and structural aspects of quality secondary teaching will create a common language for discussing these constructs and also contribute to improved support for secondary teachers, particularly within LMICs.

Introduction: Rationale for measuring the quality of teaching practices in Secondary Education

Demand for secondary schooling within low- and middle-income countries (LMICs) is rising exponentially. With the Education for All movement and the adoption of free primary education in a number of contexts, greater numbers of students have been accessing and completing primary school. This has led to increased focus upon the subsequent stage of transitioning and supporting students to remain in secondary schools (Mastercard Foundation, 2020; Null et al., 2017). This continuation is also being facilitated by shifts to free secondary education in numerous LMIC contexts (Evans & Acosta, 2021). It further follows the considerable progress made in the two last decades with access to secondary schooling, with recent statistics reporting substantial increases in the number of out-of-school youth globally who are able to access schooling (UNICEF, 2021).

In addition to a focus on increased participation, the provision of high-quality and relevant secondary education that prepares students not only for school, but employment and civic participation has become a priority for many LMIC’s education systems (Hatch, 2015). This heightened focus has arisen in response to both the growing demand for secondary schooling and the challenges affecting the quality of teaching within this context. For instance, due to the increased need for secondary teachers in a number of LMIC contexts and the inaccessibility for many to quality training, numerous un- and under-qualified teachers exist (World Bank, 2018). Large class sizes and few resources can place further pressure upon teachers. In addition, the trend towards curricula reform can bring new demands which are often not met with opportunities for professional development, requiring teachers to have skills and adopt strategies for which they may be ill-equipped (Mastercard Foundation, 2020; Ochoa et al., 2018).
Compounding these challenges, many students who enter secondary school have low levels of basic literacy and numeracy which can detrimentally impact their learning and engagement as curricula and content become more advanced (World Bank, 2018). For example, evidence has shown that 61% of lower-secondary school aged adolescents worldwide do not meet minimum proficiency levels in reading, a trend which is even more concerning in LMIC contexts (e.g., 89% in Sub-Saharan African region) (UNESCO, 2017). Evidence has further revealed that dropout becomes more likely as students get older. For example, a study which examined dropout risk for 44 developing countries found that while the likelihood in pre-adolescence is typically rare (e.g., 2.6% for both boys and girls at age 10) it rises significantly between the ages of 14-19 to an average of 39% among boys and 50.2% among girls. These findings underscore the adolescent effect of school dropout as well as the significantly higher risk faced by girls, particularly those from rural and economically disadvantaged backgrounds (Wils et al., 2019).

Across contexts, these teacher and student factors underscore the strong need for increased focus upon both structural and process quality within secondary education, with the former denoting aspects of the classroom environment which facilitate effective learning and the latter, the quality of teaching which occurs in the classroom. Quality teaching is central to student success in secondary school. It requires not only sufficient numbers of teachers, but that these teachers are equipped with the skills and resources to instruct and support learners wholistically in increasingly diverse classrooms. Research, including that involving secondary pupils, has shown that the difference between the impact of a weak and great teacher on student test scores is equivalent to one to two years of schooling (Bau & Das, 2017; Evans & Yuan, 2018; Hanushek & Rivkin, 2010). Moreover, evidence suggests several consecutive years of effective teaching can offset the learning shortfalls of marginalized students (Hanushek & Rivkin, 2010; Nye et al., 2004) and significantly improve students' long-term outcomes (Chetty et al., 2014).

In broader terms, the benefits that can be accrued from improvements in secondary schooling are also considerable (See Null et al., 2017, for review). In studies involving data from multiple developing countries, for instance, economists have indicated that each year of schooling attended brings a 5-12% return (Barro & Lee, 2010). Additionally, increases in cognitive skills have been shown to lead to increased wages and overall GDP growth in these contexts (Hanushek & Woessmann, 2008). Given these associations, greater attention to enhancing the quality and relevance of secondary teaching could go a long way in improving not just youth outcomes, but issues of poverty and socio-economic development within LMICs more broadly (Null et al., 2017).

In response to the growing need to improve the quality of secondary schooling in LMIC countries the World Bank has developed Teach Secondary to better understand secondary teachers’ professional development needs and contribute to the professionalization of secondary teaching worldwide. The development of Teach Secondary has also been fueled by the success of Teach Primary and Teach ECE, which has led to increased demand from a diverse set of users including
government, think tanks, and NGOs for a version of the tool applicable to secondary school classrooms.

The purpose of this review is to present a framework for defining and measuring the quality of secondary teaching within LMICs. In addition, it aims to justify this framework through the provision of a systematized evidence-base on effective secondary teaching practices, with a particular emphasis on research examples from LMICs.

To achieve these aims, this paper is structured as follows: Section 1 begins with a summary of differences between primary and secondary teaching and learning, distinctions which have helped inform revisions to the Teach Secondary instrument; Section 2 presents an overview of the Teach Secondary classroom observation tool; Section 3 provides a literature review of the evidence supporting the aspects of structural and process quality measured by Teach Secondary; and, Section 4 concludes with a brief discussion of how Teach Secondary can be used for monitoring, formative, and research purposes.

**Section 1: Differences between Primary and Secondary Teaching and Learning**

A number of differences between primary and secondary teaching and learning have been identified. Research has examined, for instance, differences between teachers’ pre-service training, content and pedagogical content knowledge, class constitution, motivation, behavior management techniques, differentiation strategies as well as conceptions of teaching and learning (e.g., OECD, 2014; Sorto et al., 2009; Westbrook et al., 2013). For learners, differences between levels of motivation, autonomy, peer interactions and receptiveness to teacher support represent just some of the topics that have been theoretically and empirically investigated (e.g., Le et al., 2017; Mahatmya et al., 2012; Roorda et al., 2011; Ruzek et al., 2016).

Additionally, and of critical interest to the current paper, are differences observed in students’ cognition at this stage of schooling. For example, three main areas of cognitive development during adolescence have been identified which include more advanced reasoning skills, greater capacity for abstract thought and an increase in metacognitive awareness (Sanders, 2013). Furthermore, and also of strong relevance to the development of Teach Secondary, are changes to engagement that can during secondary education. As research on engagement commenced to better understand student dropout (Finn, 1989), a wealth of literature exists that addresses the adolescent years (see Mahatmya et al., 2012, for review). Based upon this, there is strong evidence to support a decline in engagement, as students get older, particularly during the transition from primary to secondary school. Research from the developmental psychology discipline tells us that this change occurs due a poor person-environment fit and decreased opportunities for autonomy and relatedness at an important developmental stage when both factors are needed to bring about healthy developmental outcomes (Mahatmya et al., 2012).
Evidence from the Global South also highlights a number of additional factors that can lead to decreased engagement in secondary schooling including student challenges with English as medium of instruction, a strong reliance on passive lecture-based teaching methods which can limit student agency and involvement, corporal punishment as well as pressures linked with early marriage, especially for girls (e.g., Akowuah et al., 2018; Mokibelo, 2014). Taken together, these findings provide a strong rationale for the development of an observation tool unique to secondary education and the needs of both teachers and the students they work with.

Section 2: Understanding Teach Secondary and its Development

What is Teach Secondary?

Teach Secondary is a free classroom observation tool that provides a window into one of the less explored and more important aspects of a student’s education: what goes on in the classroom. The tool is intended to be used in secondary classrooms and was designed to help countries, in particular LMICs, monitor and improve teaching quality.

How was Teach Secondary developed?

To finalize a working version of the tool, the Teach Secondary development team rigorously researched, revised, and piloted different iterations of the tool over a 2-year timeframe. The development of the tool began with testing an adapted version of Teach, developed by researchers at the Research for Equitable Access and Learning (REAL) Centre and Laterite in collaboration with the World Bank’s Teach team, within 103 secondary mathematics classrooms in Rwanda as part of the Mastercard Foundation’s Leaders in Teaching initiative (Carter & Rose, 2021). Based on this preliminary work, researchers from the REAL Centre joined as consultants with the Teach team to support further development of Teach Secondary for broader application across subjects and contexts.

The development team reviewed the theoretical and empirical evidence from LMICs to further assess both the relevance of the existing Teach framework to the secondary level and additional classroom practices that were applicable to this stage of schooling but not captured in the existing tool. This review also included in-depth analyses of existing observation protocols that had been applied in secondary classrooms, with a focus on those used in the Global South.¹ This review was complemented by in-depth discussions with academics and

¹ These included: Mathematical Quality of Instruction (MQI) (Hill et al., 2008); PLATO (Grossman et al., 2013); Classroom Assessment Scoring System-Secondary (CLASS-S) (Pianta et al., 2012); Teacher Instructional Practices and Processes System (TIPPS) (Seidman et al., 2018); the Stallings Classroom Snapshot (Stallings, 1976); International System for Teacher Observation and Feedback (ISTOF) (Teddle et al., 2006); and, the UTeach Observation Protocol (Walkington & Marder, 2018).
education practitioners, including those specialized in inclusive education. This process led to further changes to the tool and resulted in an extended framework of 10 elements and 34 behaviors.

This extended framework comprised the first working version of the Teach Secondary tool which was sent for internal review, a process involving numerous Teach colleagues who were instrumental in the development of the original observation protocol and its adaptation to other levels of schooling. This process led to further revisions and constructive discussions on changes to Teach Secondary that might also complement other versions of the tool. The preliminary Teach Secondary tool was piloted through classroom video footage in Uganda, Tanzania, and Guyana. This process resulted in a revised tool comprised of 10 elements and 32 behaviors.

The development team convened a technical advisory panel, including Kwame Akyeampong, Lindsay Brown, Daniel Muijs, Herine Otieno-Menya, Albert Paulo Tarmo, and Pauline Rose, to provide written feedback on the tool. Their comments were compiled and addressed as part of a technical workshop, during which the experts clarified feedback points and advised the team on which issues to prioritize and how to incorporate the comments to further improve the tool.

This updated version of Teach Secondary is currently in the process of being piloted and validated. As of early 2022, pilot trainings have occurred in Andhra Pradesh, India and discussions are taking place for use within the Cameroon, the Western Balkans and the Pacific Islands. Within Andhra Pradesh, India, stakeholder discussions, the master coding process, and observer training are currently underway. These pilot activities, along with feedback from the Teach Secondary Expert Panel Review, will help inform of any needed revisions to the instrument and ultimately provide an opportunity to ensure the tool’s sustainability for LMICs.

Teach Secondary Framework

Teach Secondary’s organizing framework captures aspects of both structural and process quality. This section contains an overview of the Teach Secondary Checklist (measuring structural quality) and Observation Tool (measuring process quality). Following this, we will present the evidence base behind the aspects of structural and process quality captured in the Checklist and Observation Tool. The manual, which includes the observation tool, can be found at the following website. Table 1 contains the variables that are measured in the structural quality checklist. These provide a basic set of structural quality indicators on which systems can choose to build upon and adapt according to local context:

Table 1: Categories in the Structural Quality Checklist:

- Total enrollment (males, females)
- Attendance (males, females)
- Type of class (age groupings)
• Number of adults assigned to a class including the number of teachers, number of assistants, number of adults providing specialized support to one or a select group of students, and number of teachers or assistants present in the classroom observation
• Duration of the lesson: time the lesson started and time the lesson finished
• Number of students with disabilities (defined as difficulty with seeing, hearing, walking or climbing stairs, remembering or concentrating, self-care, communicating or managing behavior)
• Number of students with Individualized Education Plans (IEPs) or who receive specialist support
• Official language of instruction, proportion of students enrolled who speak the same language at home as the language of instruction, and language(s) the teacher taught in during the observation
• Number of minutes students were left unsupervised
• Severe negative verbal/physical interactions observed (if any, enumerators are required to specify what they saw)
• Resources available to students e.g., textbooks, exercise books, pens, pencils, and the number of students who had the opportunity to manipulate these resources
• Resources available in the classroom such as blackboard/whiteboard, chalk or marker, teaching and learning materials apart from textbooks (e.g., laboratory equipment, Information Communication Technology (ICT))
• Facilities observed from inside the classroom: a weatherproof roof, working electricity connection, windows, sufficient light and contrast for reading what is written on the board from the back of the room, number of students who do not have a desk to sit at, whether the teacher can reach all students’ workspace or desk
• Facilities observed from outside the classroom: steps leading up to the classroom, whether the main entrance is wide enough for a person in a wheelchair to enter, clean drinking water, hand washing facilities appropriate for students, toilets with hand washing facilities appropriate for students, separate toilets for girls, and clean toilets.

Observation tool description

As part of the Observation Tool, which covers aspects of process quality, Teach Secondary captures:

(i) Time on Learning: the time secondary teachers spend on learning activities, the extent to which students are on task, and the extent to which students are actively participating in their learning
(ii) Quality of Teaching Practices that help develop students’ cognition and socioemotional development.

As part of the Time on Task component, three “snapshots” of 1–10 seconds are used to record the secondary teacher’s actions, the number of students who are
on task throughout the observation, and whether students are actively participating in learning.

The Quality of Teaching Practices component is organized into three primary areas: Classroom Culture, Instruction, and Socioemotional Skills. These areas have nine corresponding Elements that point to twenty-nine behaviors. The behaviors are characterized as Low, Medium, or High, based on the evidence collected during the observation. These behavior scores are translated into a 5-point scale that quantifies the Quality of Teaching Practices as captured in a series of two, 15-minute lesson observations.

Figure 1: TEACH SECONDARY Areas

Teach Secondary Areas
As described above, the Quality of Teaching component of Teach Secondary is organized into three Areas. They provide a broad framework to measure the following:

**Classroom culture:** The focus of this area is on the teacher’s creation of a culture that is conducive to learning. The focus here is not on the teacher’s correction of students’ negative behaviors but rather the extent to which the teacher creates a supportive learning environment and sets positive behavioral expectations.

**Instruction:** The focus of this area is on the teacher instructing in a way that deepens student understanding and encourages critical thought and analysis. The focus here is not on content-specific methods of instruction, but rather, the extent to which the teacher facilitates the lesson, checks for understanding, provides feedback, and encourages students to think critically.

**Socioemotional skills:** The focus of this area is on the teacher fostering socioemotional skills that encourage students to succeed both inside and outside
the classroom. To develop students’ social and emotional skills, the teacher instills autonomy, promotes perseverance, and fosters social and collaborative skills.

**A focus on “Whole Child Development”**

*Teach Secondary*, as with other versions of the tool, adopts a “Whole child Development” approach which treats learning as a multi-faceted process (Porticus & Australian Centre for Education Research, 2020). This includes supporting and encouraging skills in students including empathy, resilience, and collaboration, in addition to cognitive skills, to enable learning which is more wholistic and connected to everyday realities. This approach is strongly reflected through *Teach Secondary*'s incorporation of a Socioemotional Skills area which emphasizes through its associated elements the importance of students developing, Autonomy, Perseverance and Socio-Collaborative capacities. Central also to the “Whole child development” concept is inclusive teaching which is treated as a cross-cutting theme within *Teach Secondary* that enables all students, including those with disabilities, to access learning without environmental barriers. This conceptualization is consistent across *Teach* versions and further aligns with the United Nations (2016) definition of inclusive education: as recognizing and eliminating barriers to quality education access for all learners; enhancing the presence, participation and learning of all students through changes in culture, policy and practices; and, giving support to learners who may be at risk of marginalization, exclusion or developmental delay.

While the evidence base is still emerging within LMIC contexts, several studies focused within secondary schools have indicated enhanced learning and affective development for students with disabilities within inclusive settings (see Kuper et al., 2018, for review). Evidence from both the Global North and South has further shown that strategies that focus on supporting students with disabilities are also beneficial for peers without (e.g., Hehir et al., 2016; Marita & Hord, 2017; Rosenzweig et al., 2011). For example, research indicates that non-disabled students can hold less prejudicial views and have greater acceptance of difference when they are educated in inclusive contexts. (Marita & Hord, 2017).

The vision for inclusion in *Teach Secondary* is grounded in the Universal Design for Learning (UDL) framework. UDL consists of three main principles including providing: 1) multiple means of representation for learners; 2) multiple means of engagement for promoting student motivation and interest in learning; and 3) multiple means of expression which allows for different ways for students to demonstrate their understanding (CAST, 2018). Drawing upon this framework, *Teach Secondary* incorporates a number of evidence-based practices which help to foster inclusivity within the classroom. Examples of these include:

- A focus on the inclusion of students with disabilities through the measurement of teachers not exhibiting bias and challenging stereotypes within the classroom
- A focus on measuring teachers’ use of multiple forms of representation to explain content within the classroom
• A focus on capturing preplanned and spontaneous adjustments to teaching which accommodate the different needs or learning levels of students

As previously discussed, Teach Secondary further considers additional dimensions of inclusion which relate to the physical learning environment. These are captured via the Structural Quality checklist which has been described in detail above.

Acknowledging the interconnectivity of practices within Teach Secondary

It is important to highlight, that whilst Teach Secondary is divided into four overarching areas, the interconnectivity of practices within the instrument and how they can relate to more than one area of teaching is recognized. Within the Classroom Culture area, for example, behaviors referring to teachers treating all students respectfully (1.1) and not exhibiting bias and challenging stereotypes related to gender and disability in the classroom (1.4a & b) have strong relevance for students’ social and collaborative skills and thus the Socioemotional Skills area of the tool. For example, teacher modeling of respect for diversity is critical for student collaboration in classroom settings that are mixed according to religion, caste, age, and gender. In addition, the behaviors related to behavior management (2.1-2.3) help adolescents develop self-regulation of their own behavior. Within the Instruction area, behaviors that encourage students to reflect on and explain their thought processes (e.g., 5.1, 5.2, 6.2) are important in nurturing students’ metacognitive skills. Additionally, the behavior referring to students asking open-questions (6.3) is reflective of students demonstrating their autonomy, or ownership of the learning process, in the classroom.

Section 3: Establishing the Evidence Base for Teach Secondary

Within this section, the empirical evidence underpinning the Teach Secondary tool is presented. This includes evidence supporting the Structural Quality checklist. In establishing the evidence base for Teach Secondary a four-stage process was applied:

1) Literature examined for the development of Teach Primary (Molina et al., 2018) was first reviewed for its applicability to secondary education.
2) Further literature was searched using several databases reflecting multiple disciplines relevant to the development of Teach Secondary. These databases included: Education Resources Information Centre (ERIC), EBSCO, Scopus, ScienceDirect, PsycInfo and the African Education Research Database.
3) Key journals, reference lists, and reference suggestions from discussions with experts were also consulted.
4) ‘Grey literature’ examples (reports, working papers), constituting material sourced through Google Scholar as well as institutional websites (e.g., UNESCO Databases on Resources on Education, World Bank library, Research for Equitable Access and Learning Centre website) were
additionally considered for their applicability to the development of Teach Secondary.

For this review, priority was given to recent (i.e., from 2000-2022), peer-reviewed literature that was clear in its written expression and methodological description, where applicable. In some cases, ‘classic’ literature, particularly relating to theoretical underpinnings of concepts and practices, were incorporated into our review. Throughout the search process, various key words and phrases were applied to represent the same element and behavior in question. For example, for item 3.1 relating to learning objectives, the following synonyms were applied: learning goals, learning outcomes, instructional objectives, instructional goals, and instructional outcomes. Across searches, various key words related to secondary students were also applied which included adolescent, high school, middle school and teenagers. To ensure a focus on low-income countries was maintained, descriptors such as developing, low-income and Global South were also incorporated. In addition, names of specific countries within the Global South that have a high production of educational research output were included in our search terms (e.g., Nigeria, Ghana, Kenya, Tanzania) (Mitchell et al., 2020).

**Structural Quality**

The Teach Secondary checklist quantifies the total **number of students enrolled in a class**, in order to give an indication of class size. Student enrollment and class size in secondary classes can vary depending on the cultural context of the country as well as type of school and its location. The number of students teachers are responsible for can influence how teachers plan and deliver instruction. Although current literature suggests teaching smaller classes does not guarantee an improvement in learning outcomes (e.g., Blatchford & Russell, 2019), much of the evidence relating to this topic is centered in the Global North and therefore not necessarily applicable to settings where class sizes can be substantially larger (e.g., Vizza et al., 2015) Most school interventions aimed at improving enrollment and decreasing student dropout generally have a positive effect and do not necessarily overwhelm resources, negatively impact the quality of teaching, or inhibit learning (Petrosini et al., 2012). Knowledge of student enrollment can be useful for supporting teachers to make the most of the opportunities afforded by a small or large class (Galton & Pell, 2010; Hattie, 2016; Wilson, 2006).

Along with identifying the number of students enrolled in a class, the Checklist also **records attendance**. Whilst enrollment indicates the number of students accessing education, attendance checks can show levels of student absenteeism and indicate whether enrolled students are actually present within class. Kamanda and Sankoh (2015) argue that attendance can be a strong indicator of how students are progressing within secondary education systems because it can reveal the rate at which students transition to, remain, progress, and complete this stage of schooling. For secondary school students, disparities in attendance can vary by gender and adolescent girls are likely to experience more barriers to taking up educational opportunities than boys. A study by Bhattarai
et al. (2020) investigating gender-sensitive secondary school attendance and achievement in Nepal, for instance, reported negative associations between age and school attendance for girls but no significant impact on the attendance of boys. These trends have also been observed in a number of other LMIC country contexts (see Sampa et al., 2021) therefore highlighting the need for ongoing focus on attendance in order to improve access to quality education.

The Teach Secondary checklist also quantifies the number of male or female students enrolled in the class who have difficulty with seeing, hearing, walking, remembering or concentrating, self-care, communicating, or managing behavior. There is general agreement that students with disabilities have increased chances of success when they are supported in schools. For example, a study by Luo et al. (2020) involving lower and upper secondary students investigated how different types of disabilities affect access to and completion of education in developing countries. The authors found that students with difficulties with self-care and remembering had lower attendance and completion rates compared with students with other types of disabilities who are generally better supported within schools (e.g., those with seeing, hearing and mobility difficulties). Moreover, females with disabilities had higher attendance and completion rates than males (Luo, et al., 2020). While having a disability has been found to negatively impact school attendance which in turn can affect practical opportunities for schooling, participation in class activities, and learning, studies also emphasize that tailored support, accommodating environments, and different types of assistance with learning can make a profound difference (Mizunoya et al., 2018).

Additionally, the Teach Secondary checklist records a count of the number of adults assigned to a class including the number of teachers and teacher assistants present in the classroom observation as well as the number of adults providing specialized support to one or a select group of students. A record of the number of teachers, teaching assistants, and learning support staff can provide useful data, for example, to help calculate the pupil-to-teacher ratio in secondary schools which can act as an indicator of educational resources (Evans & Yuan, 2018). Teacher assistants or learning support staff perform complementary roles relating to teaching and non-teaching tasks (Navarro, 2015; Sharma & Salend, 2016). Learning support staff may assist teachers due to limits on class sizes, over-crowding or to support the inclusion of students with learning difficulties or disabilities so they can be integrated within the class rather than be separated by levels of attainment (Navarro, 2015). Learning support staff who are special educators supervise the practice of inclusive education and promote the well-being of all students including students with disabilities by collaborating with classroom teachers to identify the needs, strengths and weaknesses of students with disabilities, and the best practices that promote the teaching of these students (Opoku, 2022). For instance, a study in Jordan reported that learning support staff working in secondary schools perceived their role positively and positioned themselves as advocates for the individual student and their capabilities, even when another stakeholder was of a different view (Lee, 2021). In low-resourced contexts, it is not uncommon for special educators to also work as teaching assistants (i.e., in supporting learning
for the whole class) in contrast to other contexts where they work more specifically on developing policies and learning plans for individual students (Opoku, 2022). In their study with secondary Ghanaian teachers, Opoku (2022) reported that mainstream teachers recognize the special educators who work in their classrooms as vital to the successful practice of inclusive education, pointing to their diversity of roles and responsibilities.

The number of secondary students with Individualized Education Plans\(^2\) (IEPs) or who receive specialist support is also recorded within the Teach Secondary checklist. IEPs are used to plan targeted strategies that can help individual students overcome learning challenges and maximize opportunities offered within school (Mbewe et al., 2021). Specialist support can involve teaching assistants or multiple teachers in co-teaching to provide special education services within regular education that focus directly on student learning goals and provide adequate planned instruction (Van Mieghem et al., 2020). Mariga et al. (2014) suggested that with limited resources major changes can be brought about via these strategies in low resourced educational systems to increase equal opportunities in education for students with disabilities and other vulnerable groups.

Data is also collected within the Teach Secondary checklist on the formal language of instruction, the proportion of students enrolled who speak the same language at home as the language of instruction, as well as the language(s) the teacher taught in during the observation. Brock-Unne (2016) argued that recognizing the alternation of languages as a norm that inherently permeates classroom dialogue, learning, and [language] teaching at secondary schools can help orient multilingual and bilingual education in contexts where the population speaks many languages. Some researchers argue that using students’ languages is an intrinsic human right and pedagogical right which can facilitate learning opportunities across subjects (Planas, 2021; Planas & Setati-Phakeng, 2014; Phakeng, 2018). In a study conducted in South Africa which involved using secondary school students’ home language to design mathematics tasks, Setati et al. (2008) reported that students’ local language served as an invisible resource to aid understanding without detracting from learning. Additionally, Wils et al. (2019) study using datasets from 44 developing countries showed that instruction in the mother tongue improved learning outcomes for adolescents.

Within the Teach Secondary checklist, a record is made of the time a lesson starts and finishes, as well as the number of minutes students are left unsupervised if it occurs. Lesson durations signal the opportunity that students have to learn. Unsupervised time with students is linked to loss of learning time arising from factors like teacher absenteeism, teacher delay from being late to class, the teacher leaving the class and leaving students unoccupied (Abadzi, 2009). This data is meaningful because instructional time has been found to have

\(^2\) In relation to the term "Individualized Education Plans", it is important to note that different descriptors can be used within different secondary educational settings to indicate plans for specific students who require specialized support.
a positive and significant effect on secondary students’ achievement, however, lower effects have been found for developing countries (Lavy, 2015).

The checklist further asks observers to record incidents of **severe negative verbal and/or physical interactions** observed in the classroom. For instance, these could be interactions perpetrated by the teacher towards students, or by students towards one or more of their peers. Interactions of this nature have been linked to a number of detrimental outcomes at the secondary school level, including physical, learning and psychological (Arënliu et al., 2022). Naz et al. (2011) interviewed secondary students in India to determine the effect of corporal punishment, for example, and students reported impeded class participation, decreased attendance, increased dropout rates, and negative impacts upon academic performance. The causes of severe negative interactions in secondary schools are varied but improvements on structural levels as well as teacher training which helps educators better manage stress, develop and promote self-awareness, and implement non-violent discipline measures could prevent incidents from occurring (Hecker et al., 2018).

The number of students who have access and opportunity to use resources like textbooks, exercise books, pens, pencils, adapted teaching and learning materials such as Braille or large font textbooks is further quantified within the Teach Secondary checklist. Textbooks which can be print or digital serve as the major source of information to both the teacher and the learner at the secondary school level because of their close relationship to classroom instruction (Aondofa et al., 2022). They are further considered one of the most reliable resources for effective learning and have been linked to improvements in the development of students’ self-regulated learning within secondary school contexts (Musilekwa, 2019; Otieno & Povey, 2022; UNESCO, 2010). Hence, inadequate access to textbooks will likely have an impact on how secondary school teachers deliver instruction, as well as on students’ opportunities to learn. To enact inclusive education within secondary schools, there should be the requisite teaching materials to ensure that the school community has access to the knowledge and resources that all students require (Opoku, 2022). Additionally, effective and tailored use of instructional materials and equipment aids the learning of students with special needs, for example, Braille textbooks or the use of enlarged font for visually impaired students (Fareo & Ojo, 2003). Such accommodations are necessary for meeting the right to ‘equal’ education because many secondary students with disabilities and/or learning challenges are left with limited opportunities to learn when school environments are not adjusted, teachers are not trained on the use of adaptive materials, and environmental, physical, and attitudinal barriers are not removed (Mizunoya et al., 2018).

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3 Examples of severe negative verbal and/or physical interactions refer to any behavior observed in the classroom that is intended to harm another individual or group physically and/or emotionally. This could be expressed by the teacher or students towards another individual or group in the classroom via verbal language (e.g., using insulting, obscene or discriminatory language) and/or physical behaviors (e.g., hitting, biting, kicking, punching, throwing objects). It is important to note that these behaviors may vary according to culture and context and therefore should be locally defined prior to using the structural quality checklist.
The *Teach Secondary* checklist additionally identifies whether the classroom has resources like a blackboard/whiteboard, chalk, or marker for writing on the boards, as well as teaching and learning materials apart from textbooks; e.g., laboratory equipment, Information Communication Technology (ICT) resources, display of students’ work, posters, and charts. Evidence indicates that secondary schools and classrooms that are adequately or well-equipped may help to motivate students and consequently increase their time and engagement in school (Damon et al., 2016). Research conducted in secondary schools in Pakistan has also suggested that laboratory environments have positive impacts on cognitive learning and also lead to enhanced academic performance with Science (Niazi et al., 2018). Additionally, improvising with locally made science and mathematics teaching aids and instructional materials when resources are not readily available has been linked to improved learning and engagement and is therefore encouraged (Okori & Jerry, 2017). ICT is also becoming a ubiquitous classroom resource within secondary school contexts. Learners are likely to adopt ICT technologies if access to ICT backbone infrastructure is provided by the government and schools or if the school has a “bring your own device” policy (Mhlan et al., 2021). A meta-analysis by Major et al. (2021) involving 53,029 learners aged 6–15 years found that technology-supported personalized learning implemented in LMIC countries had an overall statistically significant moderate positive effect size on learning. However, it is recommended that careful thought and planning should go into how to effectively integrate pedagogical techniques with technology (Damon et al., 2016; UNESCO, 2020a).

Lastly, the *Teach Secondary* checklist is used to record observations of facilities found inside and outside the classroom. A check of inside the classroom involves taking note of whether there is a weatherproof roof, working electricity connection, windows, sufficient light, and contrast for reading what is written on the board from the back of the room, as well as the number of students who do not have a desk to sit at and if the teacher can reach all students’ workspace or desk. According to UNESCO (2020b), the above classroom features are considered essential conditions for learning and inclusion across levels of schooling. A study conducted within secondary schools in Ghana also found that adequate school and classroom facilities contributes to a positive educational environment which in turn leads to enhanced academic performance (Baafi, 2020).

The record of facilities found outside of the classroom involves checking whether: there are steps leading up to the classroom, the main entrance wide enough for a person in a wheelchair to enter, there are clean drinking water facilities and hand washing facilities appropriate for students, toilets with hand washing facilities appropriate for students as well as clean and separate toilets for girls. The condition of school access routes, buildings, and other facilities often violate key dimensions of the right to education such as accessibility, acceptability, and adaptability; therefore, safe and accessible schools are crucial for all students including those with disabilities (UNESCO, 2020b). In addition, the installation of drinking water and handwashing stations have been found to decrease student absentee rates after implementation by
26% in a school-based program comprising secondary schools in rural Kenya (Blanton et al., 2010). Other research has shown that the absence of separate toilets impacts attendance especially for pubescent girls who have to deal with menstrual hygiene issues during school. Hence, access to sanitation facilities is linked to concerns about safety, privacy, and risk of harassment or assault (Adukia, 2017; UNESCO, 2020b). Taken together, these studies demonstrate the significant impacts that the absence of basic amenities can have on secondary students’ overall learning and well-being.

**Process Quality**

Within this section, a detailed description of the evidence for each Area, Element, and behavior of Teach Secondary is provided.

**0) Time on Learning**

*Teach Secondary* includes the following three observable behaviors which are captured collectively as three separate snapshots within observed lesson segments to determine whether secondary teachers maximize time on learning in the classroom:

*0.1 The teacher provides learning activities for most students*

*0.2 Students are on task*

*0.3 Students are actively participating in learning*

**0.1 Teacher provides learning activity to most students**

A number of studies have indicated positive associations between learning activity within the secondary classroom and student outcomes (Abadzi, 2007; Ayodele, 2014; Bruns & Luque, 2014; Bruns et al., 2016; Opateye, 2012; Rivkin & Schiman, 2015). For example, within Brun and Luque’s (2014) study which involved over 15,000 classrooms, 2700 schools and seven Latin American countries (LAC), use of time in the classroom was correlated with student achievement across school levels including preschool, primary and secondary. In Brazil, for example, the highest performing schools spent, on average, 70% of classroom time on academic activities, 27% on classroom management and 3% with the teacher off-task. For the lowest-achieving schools, 54% of time was spent on academic activities, 29% on classroom management, 7% with the teacher off-task and 3% with the teacher absent from the classroom. A similar pattern was observed across other LAC countries indicating that irrespective of context, students have better learning outcomes when teachers devote more time to academic activities.

Similar results have been found in Lavy’s (2015) research examining PISA (2006) scores from 15-year-old secondary students in 50 developed and developing countries. This study found that instructional time, measured as the time per week spent on instruction, had a positive and significant effect on test scores, but that this effect is strikingly lower in developing countries. A key implication from this research was the importance of considering “productivity
of instructional time”, particularly for low-income countries that can experience a high degree of teacher absenteeism and a lack of strategies for effectively reducing time spent on non-learning tasks (Bashir et al., 2018; Bruns & Luque, 2014). This concept was described as “endogenous”, and whilst not clearly defined was expressly noted as being affected by a number of factors including the quality of school inputs, teacher training, class size and learning resources, among other factors (Lavy, 2015, p. 415-416). As stated further by Lavy (2015):

“The significant association between instructional time productivity and the structure and working environments of educational systems in OECD countries points toward a path for improvements in all nations. For developing countries in particular, one avenue for enhanced educational and economic progress clearly lies in closing this gap in productivity of instructional time” (p. 419).

0.2 Students are on task

Student engagement during secondary school warrants particular attention due to its tendency towards decline during adolescence (Mahatmya et al., 2012; Mokibelo, 2014), especially given its relationship to positive learning outcomes. When student engagement is factored into time on learning, for example, even stronger associations with achievement can emerge for secondary classrooms, revealing that successful involvement of the whole class leads to better classroom management and greater opportunity for student learning (Ayodele & Ayodele, 2014; Bruns & Luque, 2014; Opateye, 2012). A study focused on secondary school math teachers in Chile has further revealed that teachers who kept students engaged tended to have superior classroom skills overall, better behavior management abilities and could devote more time to instructing their students (Bruns et al., 2016). These findings supported a plethora of research attesting to the importance of student engagement for adolescence, in not only achievement, but also other domains including school retention and socio-emotional functioning (see Hughes, 2015).

0.3 Students are actively participating in learning tasks

Active participation in learning is often described within educational research as learning that requires students to engage cognitively and meaningfully with content and/or materials presented within a lesson (Bonwell & Eison, 1991). While definitions and approaches to identification vary for active participation, overt student behaviors are often considered a useful proxy for reflecting whether or not students are engaged in their learning (Chi & Wylie, 2014). For example, the ICAP framework outlines different modes or categories of learning involvement that link to different overt behaviors that bring about different knowledge-change or learning processes. These include Interactive, Constructive, Active and Passive modes of learning and can be treated as a continuum. In other words, Constructive learning-which may be observed via student behaviors such as answering comprehension questions with a peer-reflects the deepest level of active learning which may occur in a classroom, whereas Passive learning-which may be observed via behaviors including
listening to a teacher instruct without doing anything else—reflects the most superficial level.

The ICAP framework, which posits that higher levels of engagement and learning come about from higher quality active learning activities, has received support from a number of classroom-based studies (See Chi & Wylie, 2014, for review). It has also informed Teach Secondary’s approach to the definition and measurement of active and passive levels of participation in learning via the observation of overt behaviors of students.

Through active participation, students have been found to better utilize higher-order thinking skills including analysis, synthesis and evaluation of information presented, as opposed to just passively receiving it. Students who are actively participating in their learning may therefore also be seen as being cognitively engaged and as such, these descriptors are frequently applied interchangeably (See Chi & Wylie, 2014, for review). A considerable body of evidence from numerous socio-cultural contexts attests to the benefits of active participation in learning on students’ engagement in the classroom and their academic performance at the secondary level (Bimbola & Daniel, 2010; Diepreye & Odukoya, 2019; Ismael et al., 2020; Khan et al., 2017). A study involving 196 Senior Secondary students from Nigeria, for example, found students attained significantly higher results on Biology assessments examining topics of osmosis and diffusion when exposed to instructional environments which allowed them to actively participate by undertaking practical activities and engaging in discussions about topics, as opposed to passively participating through traditional lecture methods and watching videos about topics (Diepreye & Odukoya, 2019). Research conducted in Pakistan involving 80 9th grade students similarly revealed significantly enhanced performance in Physics with students who actively participated in the classroom compared with those who were passively involved in all dimensions on learning including knowledge, understanding, application, problem solving, observation and reasoning (Khan et al., 2017).

While active participation is frequently acknowledged amongst educators as an effective classroom practice at the secondary level and a key measurable factor associated with teaching quality within many Southern contexts (e.g., Carter et al., 2021) conventional lecture methods which limit student involvement still prevail, a tendency which highlights the need for greater focus on this type of learning (Bimbola & Daniel, 2010).

A) Classroom Culture

Within Teach Secondary, Classroom Culture comprises two elements: the extent to which the Secondary teacher fosters a Supportive Learning Environment that is conducive to learning for all students and the extent to which the secondary teacher is effective at setting Positive Behavioral Expectations in the classroom.

1. Supportive learning environment
A supportive learning environment which is characterized by positive teacher-student interactions is central to effective teaching and learning within secondary classrooms. A wide array of literature indicates that secondary students derive numerous cognitive and affective benefits when they are given the opportunity to learn from teachers who exhibit respect, use and encourage positive language and respond to their academic and socio-emotional needs in the classroom (e.g., Kodero et al., 2011; Onyango et al., 2016; Roorda et al., 2011; Thompson, 2018). Additionally, the importance of treating students equitably and challenging harmful stereotypes which may discourage or hinder learning have been emphasized across socio-cultural contexts as essential teaching practices for promoting adolescent engagement, cognitive development and socio-emotional growth at the secondary school level (e.g., Asamoah et al., 2018; Neetu et al., 2017).

*Teach Secondary* includes the following behaviors (including two sub-behaviors) to measure the extent to which the secondary teacher is effective at establishing a supportive learning environment in the classroom:

1.1 *The teacher treats all students respectfully*
1.2 *The teacher uses positive language with students*
1.3 *The teacher responds to students’ needs*
1.4a *The teacher does not exhibit gender bias and challenges gender stereotypes in the classroom*
1.4b *The teacher does not exhibit disability bias and challenges disability stereotypes in the classroom*

**1.1 The teacher treats all students respectfully**

While definitions and expressions may vary according to culture and context, respect has been broadly described via behaviors including paying close attention, acknowledgment, deference, and valuing of another’s point of view (Deutsch & Jones, 2008; Thompson, 2018). At the secondary level, teachers’ respect of pupils has been related to enhanced academic achievement (Mertz et al., 2015) as well as to more positive teacher-student and student-student relationships (Deutsch & Jones, 2008; Thompson, 2018). Mertz et al.’s (2015) research, focused on the relationship between German secondary students’ perceived teacher respect and achievement in mathematics, for example, found that respect was significantly associated with performance, even above that accounted for by intelligence. In addition, a study involving 160 secondary students from Jamaica showed that pupils highly valued being respected by teachers. Their views on the quality of teaching and the learning environment as well as their own manifestations of respect towards others were also strongly influenced by the degree to which they felt respected by teachers and school leaders, particularly the extent to which they felt “listened to.” This research revealed that showing respect plays a key role in positive teacher-student as well as student-student relationships both of which have implications for student discipline and academic achievement (Thompson, 2018). Complementing these findings, research from Kenya has emphasized teacher respect as a salient aspect
of teacher quality. In a study involving 80 secondary students from four provinces, lack of student respect was found to be a key trait associated with ineffective teachers. According to students, respect was an integral part of teaching and teachers who underrated their students were perceived as ineffective. Within this study, teacher disrespect was also associated with disengagement in learning (Kodero et al., 2011).

1.2 The teacher uses positive language with students

Positive language, constituting praise, reinforcement, and encouragement, is another teacher behavior that can exert considerable impact on secondary students (Markelz & Taylor, 2016). A study conducted in Kenya (Onyango et al., 2016), for example, found that positive reinforcement and praise specifically were highly effective teaching strategies that contributed to positive behavior change and helped teachers manage behavior problems. Of strong relevance to the development of Teach Secondary is evidence also suggesting that the preferred mode of delivery of positive language, and the extent to which it can influence students, differs according to developmental stage. Elwell and Tiberio’s (1994) study assessing reactions to praise among 279 and 341 7-12th graders found that praise was regarded more positively for academic work than for behavior, and preferred to be delivered quietly, in most cases.

Within Elwell and Tiberio’s (1994) study, a curve emerged to the intensity of praise expected by students at different stages of schooling. For example, responses ‘all the time’ and ‘praise loudly’ were chosen in higher numbers in Grades 7-8, dropped in Grades 9-10 and then rose once more for Grades 11 and 12. Overall results indicated that secondary students view teacher praise favorably, but that positive language can be received differently dependent on student need for public and private praise and may change according to grade level. A later study similarly found that adolescent students ranked teacher praise for academic behavior highly, however, quiet praise was most preferred with gestural praise also emerging as the favored type of encouragement from classmates (Fefer et al., 2016). Interestingly, however, other research has not identified differences between the effects of quiet and loud praise on adolescents appropriately engaged and disruptive behaviors (Blaze et al., 2014). Whilst, to our knowledge, direct comparisons between the effects of teacher gestural (non-spoken) and spoken praise have not been empirically examined, the application of nonverbal praise has long been attributed to positive student outcomes (see Blaze et al., 2014, for review). In relation to these findings, Teach Secondary acknowledges that varied types of praise can be impactful for adolescent participation and learning in the classroom. This includes both spoken and nonverbal examples which can be initiated by teachers as well as students.

1.3 The teacher responds to students’ needs

The importance of a positive learning environment for adolescent learning has been well established. Teacher emotional support plays a key role in the establishment of a positive classroom culture and at the secondary level has
been found to influence student motivation, attendance, engagement, school adjustment, social skills, and achievement (Klem & Connell, 2004; Malecki & Demaray, 2003; Ryan & Patrick, 2001). Teacher emotional support can manifest through a variety of forms, including respect for students, genuine concern and care for students needs as well as an interest in understanding students’ feelings and perspectives (See Ruzek et al., 2016).

Commonly, teacher emotional support is determined through affective teacher-student relationships (TSRs), as seen in Roorda et al.’s (2011) meta-analytic study representing the United States, Canada, Europe, Asia, Australia and Africa. This study, which sheds lights on how these relationships differentially impact students at the primary and secondary level, found that associations of TSRs with student engagement and achievement were considerable for students from both levels of schooling across country contexts, therefore supporting earlier research (e.g., Bergin & Bergin, 2009; Davis, 2003; Hamre & Pianta, 2001; Pianta et al., 2003; Skinner & Belmont, 1993, cited in Roorda et al., 2011). As anticipated, results demonstrated positive associations between positive TSRs and engagement and achievement, and negative associations between negative relationships and engagement and achievement with the latter showing weaker associations compared with the former. Affective TRS were further found to be more important for students who are academically at risk, particularly those who experience learning challenges and/or come from disadvantaged socio-economic backgrounds.

Of particular interest from this review was the finding that affective TSRs were more impactful for older students, even into late adolescence. As emphasized by the authors, this is a remarkable result, especially given claims made in earlier research that the older students become, the more independent from teachers and focused on peers they become (e.g., Buhrmester & Furman, 1987; Hargreaves, 2000; Lynch & Cicchetti, 1997, cited in Roorda et al., 2011). In contextualizing this finding with reviewed literature (see Roorda et al., 2011), engagement tends to decrease as students advance in age, which may mean that TSRs have greater influence due to the new challenges they encounter as a consequence of having to grapple with a more complex school system and lower engagement. Relationships with teachers have also been found to become less positive as students become older which may result in a greater valuing and receptiveness to positive TRS, when experienced. Other posited explanations include more limited exposure to the same teacher in secondary (and therefore fewer opportunities for contact and rapport building) and less personal and positives TSRs at this level. As suggested, this could make secondary students more sensitive to the emotional support they are given by teachers (Roorda et al., 2011).

Ruzek at al.’s (2016) research focused on adolescents has also found that the association between teacher emotional support and engagement and motivation is mediated by students’ self-reported experiences in relation to autonomy and relatedness, but interestingly, not in competence. In other words, teacher emotional support can also indirectly influence student opportunities to exercise autonomy and can help facilitate stronger relationships with peers.
1.4a The teacher does not exhibit gender bias and challenges gender stereotypes in the classroom

Ensuring that boys and girls are given equal opportunity to learn, contribute and feel valued within the classroom is a key component of a positive learning climate within secondary classrooms (Pittinsky, 2016). Commonly, however, differential treatment is applied to male and female students with gender stereotypes perpetuated, directly or indirectly within schools and classrooms (UNESCO, 2018c). Within Zimbabwe, for instance, a qualitative observational study revealed that senior secondary students who were male had more teacher-initiated contact, direct questions, teacher feedback and attention compared to girls (Mutekwe & Modiba, 2012). In a study involving teachers and secondary students in Ghana, teachers also named twice as many male students as female students when asked to identify their top five pupils (Lambert et al., 2012). In a comparative content analysis of Malaysian, Indonesian, Pakistani and Bangladeshi secondary school text-books, a pro-male bias in textbooks was also observed with cross country analysis revealing that the female proportion of textual or picture content was 40.4%, with female occupations primarily portrayed as domestic, traditional and less prestigious than men. Within Pakistani and Bangladeshi textbooks, these proportions were even lower, constituting 24.4 % and 37.3%, respectively (Islam & Asadullah, 2018).

At the secondary level, stereotypes have been found to exert a significant influence on students both cognitively, through achievement (Carlana, 2019) and affectively, through self-concept (Igbo et al., 2015). Stereotypes and beliefs, typically associated with girls’ exclusion in education, may also detrimentally impact boys, particularly during adolescence. In a number of countries, boys are often seen as tough and rebellious and as a result are more likely than girls to experience harsh discipline and corporal punishment from teachers (UNESCOa, 2018). In Mongolia, for example, the higher likelihood of corporal punishment against adolescent boys can lead to decreased engagement in learning, limited attendance and eventual school dropout, particularly students who come from impoverished, rural areas (UNGEI, 2012). Within Andhra Pradesh and Telangana states in India, two-thirds of boys reported experiencing physical violence from teachers, compared with just over a half of girls (Morrow & Singh, 2019).

While gender stereotypes can impact learners and learning at different levels, research focused on LMICs suggests that during adolescence there is a shift in the influences of gender socialization. For example, while peers and school have been found to exert a relatively lower influence on gender socialization compared to schools in childhood, during adolescence, and particularly mid-adolescence, these sources of influence become just as powerful as the family indicating secondary schools play an essential role in helping challenge gender stereotypes that may impede learning (Neetu et al., 2017).

1.4b The teacher does not exhibit disability bias and challenges disability stereotypes in the classroom
Whilst the right to secondary education for students with disabilities has been emphasized\(^4\) and access has undoubtedly improved, many students continue to face constant barriers in expressing and developing their abilities, particularly those from low-income countries (UNESCO, 2018b; UNICEF, 2017). Within these contexts difficulties can be manifold and include: prejudice; negative attitudes towards disability, which in some cases, can lead to harmful practices and/or violence; low or limited teacher expectations in respect to interests, abilities and ambitions; and rigid examinations systems, particularly as students advance from primary education (Njelesani, 2019; Rohwerder, 2018; UNESCO, 2018b). The learning experience can be further complicated for students with disabilities as they leave primary education and transition into secondary schooling, due to the curriculum’s greater complexity, increased class sizes and the stronger emphasis upon academic achievement. Students are also required to be more autonomous and manage their own learning at this level of education. Physical and emotional changes of adolescence can also bring about additional challenges for secondary students with disabilities which can significantly impact learning as well as social interactions (Jones et al., 2018).

Within low-income countries these issues can be further magnified by disability stigmas that are often compounded by other social attitudes regarding gender, ethnicity, religion, and poverty (Njelesani, 2019; Rohwerder, 2018). A study conducted in Rwanda examining the experiences of secondary school girls with disabilities who were from economically disadvantaged backgrounds demonstrated that, despite a strong willingness and ability to achieve academically, girls were frequently “put down” and subjected to sexist speech and behavior during class, behaviors which were often ignored by teachers (Wallace et al., 2018).

Disability stigma, which can result in bias, stereotyping, fear, embarrassment, anger, and avoidant behaviors has been linked to a number of negative academic and psycho-social affects (Baffoe, 2013). Studies have also suggested that adolescents have a heightened consciousness of being stigmatized which can result in disengagement in schooling, increased anxiety and depression (See Daley & Rappolt-Schlichtman, 2018, for review). Conversely, secondary students with disabilities who are in classrooms where teachers treat all pupils equitably, encourage participation and challenge stereotypes have expressed greater confidence in their ability to achieve academically and more positive social relationships due to less discriminatory behaviors and attitudes from peers (Asamoah et al., 2018). Taken together, this research underscores the need for secondary teachers to understand the detrimental impacts that come from disability bias and stereotyping and the importance of equal opportunities and expectations within a classroom which can enable all students to thrive.

2. Positive Behavioral Expectations

\(^4\) For example, through the Convention on the Rights of Persons with Disabilities, Article 24.
Setting and maintaining clear, positive behavioral expectations can foster a productive learning environment and support teacher-student relations, quality instruction, and students’ psychosocial and academic development. Specifically, acknowledging and rewarding students’ positive behavior, instead of reprimanding undesirable behavior, can increase appropriate student engagement and reduce disruptions (Lewis et al., 2008; Markelz & Taylor, 2016). Evidence from developed and developing countries further shows that ignoring inappropriate behavior while reinforcing appropriate behaviors can resolve behavior management issues in secondary classroom contexts (Malmgren et al., 2005; Osakwe, 2014). Teachers can redirect misbehavior by looking for productive ways to help students feel empowered, valued or recognized. To ensure students understand what constitutes appropriate behavior, secondary teachers should develop a behavior management plan, communicate expectations to students clearly and then remain consistent in the use of positive rewards and consequences. In addition, research has suggested that involving students in the process of developing this plan can go a long way in strengthening teacher-student relations and students’ sense of responsibility and acceptance in the classroom (Lewis et al., 2008; Malmgren et al., 2005).

*Teach Secondary* includes the following behaviors to measure the extent to which the secondary teacher is effective at establishing positive behavioral expectations:

2.1 **The teacher sets clear behavioral expectations for classroom activities**
2.2 **The teacher acknowledges positive student behavior**
2.3 **The teacher redirects misbehavior and focuses on an expected behavior, rather than the undesired behavior**

### 2.1 The teacher sets clear behavioral expectations for classroom activities

Effective behavior management is a critical ingredient of a positive and productive classroom environment and can facilitate teacher-student relations, quality instruction, learning, self-discipline, and a sense of responsibility within students (Chiu & Chow, 2011; Lewis et al., 2008; Osakwe, 2014). In particular, holding positive classroom behavioral expectations of students can help promote their psychosocial and academic development, particularly when these expectations are made transparent. It is widely accepted amongst educators that the clear articulation of behavioral expectations is paramount for children in lower grades, however, the importance of this to secondary classroom settings is less appreciated. As stated by Malmgren et al. (2005, p. 5):

“(An) erroneous belief is that adolescents understand what constitutes appropriate school behavior and can exhibit these behaviors at will. This attitude can actually undermine teachers because they feel it unnecessary to explicitly articulate a classroom management model to older students. These false assumptions lead to unnecessary problems in the classroom and create an additional burden to students who have disabilities or difficulties that affect their social behavior.”
As such, one effective strategy for secondary teachers is to establish a clear behavior management plan prior to teaching and clearly communicate expectations to students, remaining consistent with plans in applying both praise and consequences in a fair and reliable manner. Though literature recommending such approaches at the secondary level is largely centered in high-income countries, research from developing countries, such as Nigeria, also recommends the use of such strategies for promoting engagement and learning (e.g. Osakwe, 2014).

2.2 The teacher acknowledges positive student behavior

Evidence demonstrates that acknowledgment of positive behavior is an effective strategy for increasing appropriately engaged behavior and reducing disruptive behaviors (Lewis et al., 2008; Markelz & Taylor, 2016). Conversely, the use of aggressive and negative language in addressing misbehavior has been significantly related to increases in student distraction in the classroom and negative affect towards teachers, as shown in study examining secondary students’ reactions to classroom discipline in Australia, Israel, and China (Lewis et al., 2007). Resounding with this study, literature from the Global South, including Osakwe’s (2014) examination of behavior management strategies that can be used to enhance quality secondary education in Nigeria, has also suggested that rewarding desirable behaviors is more effective than reprimanding undesirable ones. A review of literature from the United States examining effects of teacher praise on attending behavior and academic achievement of students with emotional and behavioral disabilities further found that for both child and adolescent participants, increases in on-task behaviors and reduced disruptive behaviors were observed when teachers acknowledged positive student behavior (Markeltz & Taylor, 2016).

2.3 The teacher redirects misbehavior and focuses on an expected behavior, rather than the undesired behavior

Literature from both developing and developed countries has suggested that ignoring inappropriate behavior while reinforcing appropriate behaviors is an effective and recommended strategy for resolving behavior management issues within secondary classroom contexts (Malmgren et al., 2005; Osakwe, 2014). Relatedly, other recommended effective behavior management strategies for use at the secondary level include the application of logical consequences, i.e., consequences that have a clear connection to misbehavior and that have been discussed with the student previous to application (Malmgren et al., 2005). Involving the student in this process can help prevent misbehavior and foster positive relationships with students so they feel accepted (Malmgren et al., 2005). According to Malmgren et al. (2005), teachers should always avoid power struggles with adolescent students. Drawing attention to misbehavior as attempting to “put a student in his place” will only increase that student’s feelings of neglect or inferiority and lead to increased “acting out.” Rather, teachers should work on redirecting misbehavior by looking for productive ways to help the student gain a sense of power or feel valued and recognized. Lewis et
al.’s (2008) study cross-cultural study of students in Australia, Israel and China also found that more subtle approaches such as hinting as well as involving students in classroom decision making processes led to greater student respect of actions at the secondary level (Lewis et al., 2008).

**B. Instruction**

In *Teach Secondary*, Instruction includes four Elements: the extent to which the teacher is effective at Lesson Facilitation, the extent to which the teacher Checks for Understanding effectively, whether and how well the teacher provides Feedback to deepen students’ understanding, and the extent to which the teacher fosters students’ Critical Thinking skills.

**3. Lesson facilitation**

How teachers facilitate lessons and represent and explain content directly affects students’ performance and motivation for learning. Teachers can facilitate lessons effectively by setting clear learning objectives, using multiple forms of representation to explain content, connecting lesson content to previous learning and/or students’ lives, and modeling new skills and thinking. Setting clear learning objectives creates an explicit focus and set of expectations that help both secondary teachers and students understand the intended outcome of the lesson (Reed, 2015). Extensive evidence also shows that across subjects, the use of multiple forms of representation enhances student engagement with and comprehension of lesson content (Quarcoo-Nelson et al., 2012; Senyefia, 2017). Secondary teachers can further improve students’ conceptual understandings (King et al., 2008), motivation (Arthur et al., 2018), and higher-order thinking skills by connecting lesson content with students’ lived experiences and real-world applications (Suryawati & Osman, 2017; Raub et al., 2015) and modeling or explicitly verbalizing reasoning (‘thinking aloud’) while demonstrating a new skill (Brophy, 1999; Salisu & Ransom, 2014; Westbrook et al., 2013). When implemented effectively, these four strategies can also help promote an inclusive learning environment where students with diverse backgrounds, learning capabilities and preferences can focus on and fully engage with lesson content.

*Teach Secondary* includes the following behaviors to measure the extent to which the secondary teacher is effective at establishing lesson facilitation:

3.1 The teacher explicitly articulates the objectives of the lesson and relates classroom activities to the objectives
3.2 The teacher explains content using multiple forms of representation
3.3 The teacher makes connections in the lesson that relate to other content knowledge, students’ daily lives or real-world issues
3.4 The teacher models by demonstrating or thinking aloud

3.1 The teacher explicitly articulates the objectives of the lesson and relates classroom activities to the objectives
Lessons that are introduced with clear objectives and followed by related activities that build skills and knowledge can lead to greater student appreciation and motivation for learning across learning levels as well as disciplines (Brophy, 1999; Gagné, 1985; Reed, 2015). As outlined by Reed (2015, pp. 16-17), setting clear learning objectives is important for two primary reasons: 1) Objectives help the teacher remain mindful of the purpose of their lessons, therefore acting as ‘a sort of road map’ throughout a lesson; 2) Objectives act as performance expectations that help both teachers and students understand what is expected as an outcome of the lesson.

For students with disabilities or difficulties, setting clear learning objectives is also considered a key indicator of effective pedagogy due to their particular need for clarity on the direction of a lesson and its requirements. In Guat and The’s (1987) experimental study examining the effects of providing less able lower secondary geography pupils within Singapore with written instructional objectives prior to learning, results found that learning was more enhanced for students within treatment compared to control groups. Overall, this study indicated that learning is made easier for students with learning challenges when objectives are made salient. In addition, it is a particularly important practice to employ within a lesson due to difficulties these learners can face with processing what is relevant and necessary for evaluation. Research comparing the goal orientations of underachieving, normal achieving and overachieving secondary students also suggests the importance of this practice for underachieving students who have been found to set fewer learning goals compared with higher achieving students (Castejón et al., 2016).

Case-study research at the secondary level has found that, contrary to ideas that objective led lessons constrain learning and result in student passivity, maintaining focus on a well-crafted objective increased student attention and engagement. It also led to better quality verbal interactions (Reed, 2015). As underscored by Reed:

“The qualitative and quantitative differences in the way teachers communicate objectives are too often overlooked in studies on effective instructional practices for students of diverse backgrounds and ability levels. This seemingly simple component is more intricate and influential than the paucity of extant literature indicates...When students are aware of the connection between an activity and the lesson objective, this awareness can guide their work and support their learning” (p. 23).

3.2 The teacher explains content using multiple forms of representation

An extensive body of literature attests to the use of multiple forms of representation in enhancing students’ engagement with and comprehension of content taught within a classroom. For instance, a teacher’s use of verbal explanation and text which is further complemented by the use of relevant concrete objects has been found to not only enhance student achievement but positive attitudes towards learning, motivation and willingness to participate in the classroom (Carbonneau et al., 2013; Kontaş, 2016). The use of multiple forms
of representation for explaining content has been further found to be highly beneficial for pupils with diverse backgrounds, ability levels and learning preferences across multiple levels of schooling (Capp, 2017). As stated by Capp (2017, p. 792), “By representing knowledge in multiple ways, teachers reduce barriers to create classrooms that are accessible for all learners.”

In respect to secondary students, research has shown the benefits that students can derive within numerous subject areas when multiple forms of representation are applied within lessons. Research conducted in Ghana involving 78 Grade 9 students, for instance, found that using physical (mathematical set instruments) and virtual (Geobebra) manipulatives in addition to verbal explanations of content in mathematics in the topic of transformation led to significantly higher achievement scores than when students were only instructed using verbal explanation alone. In addition, this study found that improvements in learning were particularly pronounced for low-achieving students when manipulatives were applied (Senyefia, 2017). Similar positive impacts on students’ problem-solving skills through the application of multiple forms of representation have been found in other studies (e.g., Moreno et al., 2011).

For science, research conducted in Ghana which examined the impact of audio-visual-aided instruction on students’ achievement in physics found that the use of these forms of representation led to significantly enhanced achievement, compared with when students only learnt with traditional lecture-based instruction (Quarcoo-Nelson et al., 2012). In regard to the language arts, research from Iran involving 80 female English learners revealed that participants provided with multimodal texts which included either: 1) printed text with pictures 2) video films with English subtitles or 3) both multimodal printed text and videos with English subtitles all outperformed students who were only exposed to a traditional linear printed text in reading comprehension assessments (Baharani & Ghafoorania, 2015).

As previously noted, Teach Secondary draws from the Universal Design for Learning (UDL) framework (CAST, 2018) to define the multiple means of representation to explain content in the classroom. The multiple means of representation considered in the Teach Secondary tool are: Spoken Language, Music, Text, Visual Aides, Concrete Objects, and Movement. Reflecting a wide array of evidence, as demonstrated above, a high-quality range in this behavior in Teach Secondary, as with other versions of Teach, requires the use of at least three means of representation.

3.3 The teacher makes connections in the lesson that relate to other content knowledge, students’ daily lives or real-world issues

Connections in learning can manifest through a variety of approaches and strategies including contextual teaching and learning, relationships to real-world problems and phenomena, links to students’ daily lives and, activation of prior knowledge. At the secondary level, evidence attests to the effectiveness of a
contextual learning approach for improving student performance (Suryawati & Osman, 2017), developing higher-order thinking skills (Raub et al., 2015) and facilitating greater personal interest in subjects (King et al., 2007). This approach, which derives from the philosophy that meaning emerges from the association between content and context, can provide teaching directly linked to the experiences and relevant contexts of learners (Baki et al., 2009). As described within the discipline of science, contextual learning can help students make clear connections between concepts and real-world applications, provide opportunities for a deeper understanding of related science in the process and aid conceptual understanding through applications to real-world issues or events (King et al., 2007).

Activating students’ prior knowledge is a well-recognized technique for supporting contextual learnings which develops both learning interests and capacities. McNamara et al., (1996), for example, examined the relationships between prior knowledge, text structure and learning with middle school students, finding that students with higher levels of prior knowledge scored better on posttests of meaningful learning, such as inference making and problem solving when presented with minimally detailed texts. The converse was found with participants with low prior knowledge. When reading a highly detailed text, prior knowledge was less related to performance, a finding that may be attributed to the fact that students did not have to access stored knowledge. Later studies with adolescents have also examined the importance of prior knowledge on reading comprehension. In examining both the direct and indirect effects of readers’ prior knowledge in secondary schools in Italy, for example, prior knowledge predicted comprehension of different texts both directly, and indirectly through mediation of inferences (Tarchi, 2010).

In respect to other contextual learning strategies, a strong body of literature supports secondary school teachers making connections to real-life situations. A study conducted in Ghanaian secondary schools, for example, found that mathematics teachers’ ability to connect mathematics to real-life problems in various subject areas was core to building interest in the subject (Arthur et al., 2018). An additional rationale for the use of real-life examples in the context of secondary school learning is that many students may not understand or appreciate the broader purpose or utility of a subject, an issue that may be due to a lack of sufficient focus of the importance of real-world relevance or application within the school curricula or pre-service teaching program (Baki et al., 2009; Gainsburg, 2008). A survey on secondary school mathematics teachers undertaken in Turkey, for example, showed that only 10% connected their lessons to real-life (Cankoy, 2002, cited in Baki et al., 2009). Resounding with these findings, surveys of secondary math teachers carried out within the US and Vietnam also provided evidence that teachers felt constrained by a lack of training, resources and ideas on how to make connections in the classroom (Gainsburg, 2008; Ng, 2006).

Related research investigating the use of daily life connections used in science classes at the primary and secondary level has revealed that secondary school teachers make far less connections during their instruction, compared with
primary school teachers (Marulcu et al., 2007). Research based on students at the secondary level has further shown they perceive the process of connecting mathematics with real-life as significant, however, they also perceive that it is not implemented sufficiently by teachers (Baki et al., 2009). Examples given by students in Baki et al.’s (2009) Turkish based study as connected to real-life were generally about numbers and examples such as calculating and shopping were mostly poor. Similarly, a study conducted in Nigeria found that secondary students felt that their chemistry teachers did not make explicit connections with their home learning experiences in teaching science concepts. Students also struggled to establish a clear relationship between what was learnt at school and science concepts embedded in their daily lives (Oloruntegbe, 2010). Overall, this literature suggests that while real-life connections are important for multiple student outcomes, teachers across contexts at the secondary level require support and encouragement in implementing these successfully.

3.4 The teacher models by demonstrating or thinking aloud

Modeling denotes the process of learning or acquiring new information, skills, or behavior through observation, as opposed to direct experience (Salisu & Ransom, 2014). Systematic teacher modeling can lead to enhanced student motivation and foster gains in learning (Brophy, 1999). Drawing upon social cognitive learning theory, modeling can also help with the development of meta-cognitive and self-regulatory skills, particularly when complemented with guidance, feedback, and social reinforcement throughout students’ practice of modeled skills (Schunk & Zimmerman, 1996, cited in Salisu & Ransom, 2014, p. 55). As content becomes increasingly sophisticated at higher levels of education and students more autonomous, models also allow for the development of independent judgments in using and communicating subject matter, allowing pupils to take ownership of their learning (Lee, 2010).

Teacher modeling has been found to be an effective instructional strategy across learning domains, country contexts, grades and ability levels (Salisu & Ransom, 2014). Westbrook et al.’s (2013) rigorous literature review of pedagogic practices that best support all students learning at both primary and secondary levels in developing countries, for example, identified demonstration as a key strategy associated with positive outcomes. According to Brophy (1999, p. 83), ideal modeling should not just incorporate cognitive modeling, but also that of engagement in a potential learning activity. In the context of language arts at the secondary level, for example, this may include communicating the thoughts and feelings one has when engrossed in a text and connecting with its characters.

Teacher modeling through ‘think-alouds’ has been underscored as a particularly effective strategy for promoting learning and understanding, notably for reading comprehension and problem solving. Think-alouds denote overt verbalization of normally covert-self-talk that helps direct students’ learning and engagement (Brophy, 1999, p. 83). Through this process, students gain exposure to experts and how they process information (Fisher & Frey, 2012). In interviews with 115 Grade 9 boys from diverse cultural backgrounds in English classes within the US, students reported they had a better understanding of content and liked hearing
about their teachers’ thought processes during think-alouds, which, in the context of reading, involved modeling comprehension, word solving, use of text structures and features. Within this study, ‘write alouds,’ denoting the modeling of writing composition processes, were also found to be important as they allowed students to observe how their teachers drew upon knowledge from texts and personal experience to develop coherent arguments. As stated by Fisher and Frey (2012, p. 592) writing aloud, as with thinking aloud, invited the student into the teacher’s mind, providing them with first-hand experience of the composing and editing process that a skilled writer used. Non-verbal modeling also helps students attend to and deepen their learning by providing ‘an informative semantic context within which to imbed verbalized rules’ (Salisu & Ransom, 2014, p. 55).

4. Checks for Understanding

Checks for Understanding and other formative assessment strategies are important and highly impactful research-based tools that secondary teachers can use to monitor students’ learning (Rosenshine, 2012). Research from across contexts show that checks for understanding and monitoring are especially effective when varied in format and used frequently and systematically (Ajayi & Ekundayo, 2011; Carter et al., 2021; Cotton, 1988; Rosenshine, 2012). Once teachers have a clear view of students’ understandings and misconceptions, teachers can adjust their instruction and tasks to students’ individual and group needs. Adjusting instruction to students’ learning levels, also known as differentiated instruction, is a recognized indicator of effective teaching at the secondary level as it recognizes and responds to the reality that students have varied needs and may require targeted and different types of support and instruction to learn (Smale-Jacobse et al., 2019). Secondary teachers adjust instruction in both micro and macro ways. Micro adjustments are made in-the-moment based on students’ immediate needs in the course of a lesson, such as switching language of instruction to communicate more effectively, while macro adjustments are often pre-planned where the teacher uses existing information, such as formative assessment data, to group students by their learning needs (Corno, 2008).

Teach Secondary includes the following behaviors to measure the extent to which the secondary teacher is effective at using checks for understanding:

4.1 The teacher uses questions, prompts or other strategies to determine students’ level of understanding
4.2 The teacher monitors most students during independent/group work
4.3 The teacher adjusts teaching to the level of the student

4.1 The teacher uses questions, prompts or other strategies to determine students’ level of understanding

Formative assessment has been described as ‘fundamentally a collaborative act’ that necessitates interaction between teachers and students (Tierney &
Checks for understanding that are both varied and frequent constitute a key type of formative feedback as well as a core component of effective instruction. Checks for understanding, for example, have been highlighted as one of the 10 most impactful research-based principles of instruction supported by evidence from cognitive science, master teachers and cognitive supports (Rosenshine, 2012). According to Rosenshine (2012), more effective teachers check to see if students are correctly learning new content. Checks for understanding also facilitate the processing needed to shift new knowledge or skills into long-term memory and enable teachers to identify students’ misconceptions. Literature from the Global South has further indicated positive and substantial effects of teacher questions and checks for understanding during lessons on student performance at the secondary level in numeracy and literacy (Aslam & Kingdon, 2011).

Checks for understanding can and should be implemented in a variety of ways. They should also involve all students. Within a lesson, effective teachers have been found to stop to check student understanding by: asking questions; having students summarize main points; having students think aloud as they solve problems; and, asking students to repeat directions or procedures. Strategies for checking all students’ understanding have also included: telling the answer to a neighbor; writing answers on a card and holding it up; or, raising one’s hand in agreement to an answer (Rosenshine, 2012). Other effective checks for understanding highlighted in literature at the secondary level include the use of individual or small group concept maps which have been effectively used in the context of science (Hartmeyer et al., 2017). In addition, checks for understanding that help guide or scaffold student learning can prevent errors and make students more receptive to teaching and feedback (Kyaruzi et al., 2019; Rosenshine, 2012).

Though a number of effective checks for understanding have been identified, questioning has been found to be the most frequently used strategy across international research examples (e.g., OECD, 2005; Young & Jackman, 2014). Despite the prevalence of this technique, however, research suggests that its quality in terms of allowing all students to adequately express their understanding can be lacking (Young & Jackman, 2018). Ampiah’s (2008) research conducted in primary and secondary classrooms in Ghana, for instance, found that teachers’ questions typically targeted a few capable students with pupils rarely given enough time to respond to questions. Kira et al.’s (2013) research conducted in secondary science classrooms in Tanzania also revealed that teachers’ frequency in checking students’ responses was typically low, with non-volunteers rarely asked questions. Overall, this research suggests that more focus needs to be given to both the quality and range of strategies secondary teachers use to determine understanding in their classrooms.

4.2 The teacher monitors most students during independent/group work

Monitoring student learning has been underscored as a core component of high-quality education as well as one of the major factors differentiating effective and
ineffective teachers at the secondary level in both Global North and South contexts (e.g., Ajayi & Ekundayo, 2011; Carter et al., 2021; Cotton, 1988; Rosenshine, 2012). Monitoring can take on two meanings within classrooms, including ‘keeping watch over, supervising’ student learning and ‘scrutinizing or checking systematically (student learning) with a view to collecting certain specified categories of data.’ Within educational research, both functions have been associated with enhanced student outcomes (Ajayi & Ekundayo, 2011; Cotton, 1988; Rosenshine, 2012). Monitoring students’ learning generally involves circulating around the classroom during seatwork, being aware of how well or poorly students are working and engaging in one-to-one contact about the learning task, as required (Cotton, 1988). Cotton’s early literature synthesis on the relationship between classroom-level monitoring and student outcomes of achievement, attitudes and social behavior involving studies across the K-12 range revealed that the most effective teachers had systematic procedures for overseeing learning and encouraged students as they worked. In addition, they initiated frequent contact during seatwork periods, rather than waiting for students to request assistance, and had substantive interactions. Effective teachers were also found to give extra attention and time to students who needed help and further stressed careful and consistent checking of work. Research focused on Rwandan secondary teachers’ perceptions of teaching quality also emphasized the importance of ongoing monitoring of student learning as well as the importance of this practice on determining student understanding and promoting student motivation in the classroom (Carter et al., 2021).

4.3 The teacher adjusts teaching to the level of the student

Adjusting instruction and tasks to students’ individual and group needs is a widely recognized indicator of effective teaching. This practice, also referred to as differentiated instruction, refers to teachers proactively adapting curricula, teaching methods, resources, learning activities or requirements for learning products so they better reflect pupils’ needs (Smale-Jacobse et al., 2019; Tomlinson et al., 2003). In the context of Teach Secondary, this practice also includes changes of language of instruction which can help facilitate student learning and engagement (Simasiku et al., 2015). Whilst differentiated instruction has received considerable attention in educational research and practice within primary classrooms, empirical evidence concerning its application and benefits for improving student attainment at the secondary level is more limited (see Hootstein, 1998; Smale-Jacobse et al., 2019, for review). Smale-Jacobse et al.’s (2019) systematic review of evidence relating to differentiated instruction in secondary education revealed only 12 unique empirical studies that met their inclusion criteria. Overall and despite conspicuous knowledge gaps, this review revealed small to moderate positive effects of differentiated instruction to achievement, thus signifying the potential benefits of the practice.

Adjustments to teaching to accommodate the diverse learning needs of students can occur in various ways. For example, both macro and micro levels of adjustment have been identified. Macro adaptations denote proactive, planned efforts for groups of similar students based on formal assessments of qualities
such as intellectual ability. These can incorporate grouping techniques, tiered assignments or projects involving differing levels of complexity. Micro adaptations, on the other hand, refer to adjustments made in the ongoing course of a lesson in response to students' varying levels of readiness or skill (Corno, 2008; Hootstein, 1998). According to Corno (2008), micro adaptations reflect the continual assessment and learning throughout teaching, or in other words, thought and action intertwined. As stated, “They represent a direct response by the teacher to individual learners and are deeply psychological because they play out in the proactive space between teaching and learning where anxieties, fears and other concerns arise.” (p. 163).

Whilst adjustments to teaching occur at both the macro and micro level within secondary education, evidence has revealed that differentiation is a less common occurrence within secondary classrooms schooling compared to primary school (OECD, 2014; Smale-Jacobse et al., 2019). Hootstein’s (1998) research report examining differentiation of instructional methodologies at the secondary level also found that while secondary teachers understand that different learners require various instructional methods to help them understand content, their differentiation predominately reflected micro rather than macro adjustments. These practices included adjusting questions, lectures with question and answer, and group discussion for the varying skill levels of students. Although some teachers within this study described practices that allowed more able students to work independently or avoid repeating known content, most efforts were directed at methods to remediate or ensure students understood core content or met basic instructional goals. Far fewer comments suggested methods that helped students develop deeper understanding. Within this study, teachers also provided insight into the barriers that make addressing academic differences difficult including class size, disruptive students, and time for planning.

According to the author, teachers’ beliefs in this study resounded with other research that has reported teacher awareness and concern about students' academic differences and needs, but also frustration with a lack of strategies on how to differentiate and confusion about which practices to use to address individual differences (e.g., Gamoran & Weinstein, 1995; Tomlinson, 1995b, cited in Hootstein, 1998). Taken together, this research points to the need for greater support with and focus upon adjusting teaching for learners of varying abilities and needs at the secondary level.

5. Feedback

Effective secondary teachers provide feedback to help students notice and understand their successes, misunderstandings, and areas for improvement. Global evidence consistently highlights feedback as a highly impactful teaching practice, which has been positively associated with student learning, engagement, and motivation (Hattie & Timperley, 2007; Westbrook et al., 2013). However, not all feedback is effective; research suggests that the most effective feedback is specific and scaffolded and provides clear information about how students have succeeded or how any mistakes can be addressed (Guo & Wei, 2019). Moreover, evidence suggests providing feedback on both misunderstandings and successes is important as each offers unique benefits to
While guiding and supporting students to see and rectify their misunderstandings can facilitate greater learning and achievement, guiding and supporting students to notice their successes can deepen students’ interests in the subject, strengthen their self-regulatory skills and nurture their motivation to do well on future tasks (Ajogbeje & Folorunso, 2012). Teach Secondary therefore includes the following behaviors to measure the extent to which the secondary teacher is effective at providing feedback:

5.1 The teacher provides specific comments or prompts that help clarify students’ misunderstandings
5.2 The teacher provides specific comments or prompts that help clarify students’ successes

Across stages of schooling, research from both developed and developing contexts has consistently highlighted feedback as among the most impactful practices available at a teachers’ disposal (Hattie & Timperley, 2007; Kluger & Denisi, 1996; Kodero et al., 2011; Westbrook et al., 2013). At the secondary level, teacher feedback has been positively associated with a number of student outcomes including achievement (Ajogbeje & Folorunso, 2012), engagement (Kearney et al., 2013) self-regulatory skills (Guo & Wei, 2019; Otieno, 2018), knowledge acquisition (Eckes & Wilde, 2019), and intrinsic motivation (Eckes & Wilde, 2019; Pat-El et al., 2012). It is widely acknowledged that considerable variability exists in the delivery of feedback and that to be effective, it should be specific, providing information on what students have done that is correct/incorrect and how mistakes can be addressed (Ajogbeje & Folorunso, 2012; Hattie & Timperley, 2007; Kyaruzi et al., 2019). According to Hattie and Timperley (2007), for example, feedback is most effective when it considers three questions: 1) Where am I going? 2) How am I going? and 3) Where to next?

Evidence based within secondary classrooms supports differential impacts of teacher feedback types on students’ learning, with more specific and substantial expressions associated with better outcomes. In a study comparing the effectiveness of three instructional strategies on mathematics achievement with junior secondary students in Nigeria, participants who were provided feedback that involved remediation (i.e. where teachers asked probing questions, encouraged students to ask questions about areas of difficulty and guided students as needs arose) significantly outperformed those exposed only to superficial applications of feedback or none at all, with the latter condition revealing the poorest performance on post-tests amongst students (Ajogbeje & Folorunso, 2012).

Guo and Wei’s (2019) study on the impact of different types of feedback on Chinese students’ self-regulatory learning skills within mathematics further revealed that scaffolding feedback (successive cues, hints or models that facilitate students coming to answers themselves) as well as praise (commending students for positive performance) were more effective for
promoting students’ self-regulated learning compared to verification feedback (dichotomous judgments of student response which affirm or negate its validity), directive feedback (giving a correct answer to student questions) and teacher criticism (negative responses to student performance or behavior). Scaffolding feedback, for example, led to greater metacognitive awareness, resource management strategies, intrinsic motivation and self-efficacy, results which reflected earlier research within other cultural contexts including United States, New Zealand, and Hong Kong (See Guo & Wei, 2019, for review). Relatedly, research conducted within Tanzania has revealed that students’ perceptions of the quality of teachers’ scaffolding feedback promotes their actual use of feedback in relation to their learning which in turn leads to enhanced mathematics performance (Kyaruzi et al., 2019). Despite this evidence, however, studies carried out in a number of international settings suggest a tendency amongst secondary educators to apply basic, limited, and superficial feedback (Brevik et al., 2016; Guo & Wei, 2019; Otieno, 2018; Voerman et al., 2012). This was revealed in a study involving mathematics secondary students from Kenya which found that teachers’ feedback was often highly restricted as well as negative, especially in relation to summative assessments. One teacher, for example, was found to repeatedly use the phrases “work harder, still very low and put more effort” in relation to students’ mathematics assessments, tendencies which were associated with a lack of pupil motivation and negative influence on self-regulation (Otieno, 2018, p. 168). Taken together, these findings underscore the need for greater attention towards the application of specific and substantial feedback types which can more effectively promote student learning.

5.2 The teacher provides specific comments or prompts that help clarify students’ successes

Making students aware of their successes in learning has been found to facilitate interest in a subject, self-regulatory skills, and continued motivation to do well on further tasks at the secondary level (Ajogbeje & Folorunso, 2012; Hattie & Timperley). Conversely, negative feedback on performance can reduce a student’s use of learning strategies and decrease motivation as well as self-efficacy (Ajogbeje & Folorunso, 2012; Guo & Wei, 2019; Otieno 2018).

As revealed in Gwo and Wei’s (2019) study, feedback expressed as praise for good performance promotes self-regulatory learning skills within the context of mathematics, whereas criticism leads to increased test anxiety. Whilst being specific about students’ successes is a recommended feedback strategy within secondary classrooms, research has shown that teachers often fail to articulate exactly how students have been successful in their learning. For instance, Voerman et al.’s (2012) study involving 78 Dutch secondary teachers showed that while 86% of teachers across subject areas provide non-specific feedback (e.g., That’s good; You’ve done a fantastic job) to students only 36% were specific (e.g., your work is very neat; you’ve taken this into account, well done). As highlighted by the authors, this finding is consistent with earlier research (e.g., Hattie, 1999) and is cause for concern because feedback in general, and specific feedback in particular, is among the most important teacher practices that can
impact student learning (Voerman et al., 2012). Within Global South contexts including South Africa and Kenya, barriers which have been identified as affecting this practice have included tendencies toward collective class interaction patterns (e.g., chorusing) and high student-teacher ratios which can prevent teachers from giving extra support to students and providing more explicit feedback, especially on an individual basis. (Kanjee, 2018; Otieno, 2018). While research based in secondary settings is limited concerning differences between group-based and individual feedback, evidence suggests that the latter type when specific can act as a powerful motivator for learning, help develop self-regulatory skills, influence higher achievement and encourage more positive attitudes towards the subject taught, teachers, peers and students themselves (E.g., Archer-Kath, 2010; Otieno, 2018).

6. Critical Thinking

One of secondary teachers’ most important tasks is to support students to develop advanced cognitive skills often acquired in adolescence, including higher order thinking and reasoning, the capacity for abstract thought, and an increase in metacognitive awareness (Sanders, 2013). While these are important skills to develop in their own right, research has also shown strong critical thinking skills are positively associated with other important outcomes such as academic achievement and motivation for learning (Abrami et al., 2015; Awan et al., 2017). Two main ways for the teaching of critical thinking have been identified in the literature including via embedded instruction where critical thinking skills are integrated into content matter and explicit instruction, with teachers give clear guidance on specific critical thinking skills in their lessons as well as opportunities for deliberate practice (Marin & Halpbern, 2011). While evidence supports the use of both approaches and the benefits that can be found from using the methods together, explicit instruction has been found to be particularly beneficial for students from disadvantaged backgrounds who frequently have less exposure to skills linked with critical thought through their schooling histories (see Marin & Halpbern, 2016 for review).

Teach Secondary encourages teachers to use instruction techniques which encourage critical thinking, such as asking open-ended questions and providing thinking tasks that expose students to authentic or situated problems, so that students have opportunities to actively apply their thinking, thus enabling them to deepen their learning and understanding of concepts and content (Enger, 1997). It also is important that teachers provide opportunities for students to ask open-ended questions and explain their thinking, as these processes can support and expand students’ capacity to reason and argue different perspectives (Davies & Meissel, 2016; Kerawalla, 2015) and can even have ripple effects whereby one student’s open-ended questions or verbalized explanations can deepen their peers’ capacities for higher order thinking (Chin & Brown, 2010). By paying attention to the type of explanations and questions students offer in classroom discussion, teachers can gain insight into students’ higher order thinking capacities and misunderstandings and subsequently adapt their instruction to deepen students’ capabilities.
Teach Secondary includes the following behaviors to measure the extent to which the Secondary teacher is effective at facilitating critical thinking:

6.1 The teachers ask open-ended questions
6.2 The teacher provides thinking tasks
6.3 Students-perform thinking tasks
6.4 Students explain their thinking to the teacher or ask open-ended questions

6.1 The teachers ask open-ended questions

Effective teacher questioning has been highlighted as an important pedagogical practice at both primary and secondary school levels across socio-cultural contexts (Aslam & Kingdon, 2011; Kane et al., 2010; Westbrook et al., 2013). Aslam and Kingdon’s (2011) research examining secondary school achievement in literacy and numeracy in Pakistan, for example, found that teachers asking frequent questions had among the largest positive effects on achievement for both literacy and numeracy of all teaching process variables examined. Whilst this research did not clarify the type nor quality of questioning used, Westbrook et al.’s (2013) extensive review of effective primary and secondary teaching practices in low- and middle-income countries specified that use of both open and closed questions, expanding responses and student questions were among the most impactful strategies associated with positive learning outcomes. These findings have also been supported by evidence from Northern contexts including Kane et al.’s (2010) study that found that ‘questioning and discussion’ generates higher reading achievement, with stronger associations found for middle grades compared with primary.

As indicated above, open-ended questions have been highlighted as a particularly effective questioning strategy for students at the secondary level. According to Hancock (1995), for example, open-ended questions within the context of mathematics are better at revealing students’ thinking due to the multiplicity of solution methods they allow, thus enriching the information available to teachers about their students’ understanding. They also send the message to students that process is just as important as the final product when it comes to solving problems. Research from the science domain further indicates the valuable diagnostic information on performance that open-ended questions enable, allowing teachers to identify students’ misconceptions (Enger, 1997).

Despite their effectiveness, however, use of open-ended questions can be limited in many classroom contexts, particularly in the Global South. A considerable amount of examined literature from both primary and secondary contexts within Westbrook et al.’s (2013) review pointed to poor use of questioning in the classroom, with high proportions of closed questions requiring recall, eliciting, or checking factual information. Whilst questioning was found to be a common strategy in classrooms, teachers typically asked the majority of questions, often in rapid succession, with minimal opportunity for students to respond. In addition, student responses were often choral requiring single-word answers and higher order questions were rare. These patterns have been reflected in Kira’s et al.’s (2013) research examining questioning techniques in secondary
chemistry classrooms in Tanzania, where 80% of teachers had difficulties promoting students’ thinking by maintaining a balance between open and closed questions or between convergent and divergent questions. Other relevant findings from this study were that teachers struggled to guide students’ discussions through effective questions, as their abilities in probing were low.

Challenges with using open-ended questions in learning in Global South contexts have been attributed to a number of factors including large class sizes, pressure to cover the curriculum, limited resources and lack of training in the use of effective questioning techniques (Westbrook, 2013). Research has also pointed to the influence of teachers’ and students’ beliefs concerning knowledge and knowing on classroom questioning practices. For example, in the context of Tanzania, teachers’ predilection towards closed and factual questions in secondary science was found to be strongly influenced by their dualist beliefs concerning science knowledge. Teachers, for example, perceived science knowledge as “right or wrong knowledge” with “one correct answer” and consequently rarely accepted students’ personal opinions or experiences as legitimate responses to questions (Tarmo, 2016, p. 16) The nature of students’ responses to questions were also found to be influenced by this belief as well as by their understanding of teachers as “knowledgeable authorities” who are not to be contested during a lesson (Tarmo, 2016, p. 8). Among the major implications of research presented in this section is the need for greater training on effective classroom questioning techniques for teachers and students which also considers beliefs concerning knowledge and the provision of resources and conditions which can facilitate effective questioning.

6.2 The teacher provides thinking tasks

While definitions vary, six cognitive capacities including interpretation, analysis, evaluation, inference, explanation5 and self-regulation have been highlighted as core critical thinking skills that can be applied across learning domains (Abrami et al., 2015; Facione, 1990). In a comprehensive review of thinking tasks, Moon (2007) explored and documented tasks that teachers from various subjects could use to strengthen these capacities. These include but are not limited to: small group debates, group critical thinking tasks under timed pressure, posing controversial questions about a topic followed by a discussion at the end of class, and responding to critical thinking tasks through short answer questions, as written exercise helps students ‘play with ideas’ and force them to develop precise and succinct writing and reasoning. In Abrami et al.’s (2015) meta-analysis examining the impact of instructional strategies on the development of critical thinking skills and student achievement amongst primary, secondary, university and graduate/adult students, opportunities for dialogue (e.g., discussion) improved outcomes of critical skills acquisition as did exposure to students to authentic or situated problems, especially when applied to problem solving and role-playing methods across educational levels. This meta-analysis

5 Thinking tasks involving student explanation is captured separately under behavior 6.4 in Teach Secondary, "Students explain their thinking to the teacher or ask open-ended questions."
also found a significant link between critical thinking instruction and critical thinking outcomes as well as academic achievement. Interestingly, results revealed no significant difference among age levels in critical thinking outcomes.

Whilst Abrami et al.’s (2015) findings suggest the relevance of critical thinking skills across year levels, research from the developmental psychology domain underscores the particular importance of critical thinking skills at higher levels of schooling. According to Sanders (2013, pp. 354-355) and as summarized earlier, there are 3 main areas of cognitive development that occur during adolescence that have strong implications for the provision of critical thinking tasks. These include: 1) the acquisition of more advanced reasoning skills, including the ability to explore a full range of possibilities inherent in a situation, think hypothetically and use a logical thought process; 2) the development of the capacity for abstract thought, and the move from being concrete thinkers to abstract thinkers who can imagine things not seen or experienced; 3) an increase in metacognitive awareness, or ‘thinking about thinking’.

Teachers who apply tasks that allow students to apply and develop critical thinking skills facilitate deep rather than surface learning. In comparing the learning approaches of eighth-grade students in Chemistry, Chin and Brown (2000) found that deep and surface learners differed across five categories including generative thinking, nature of explanations, posing questions, metacognitive activity and task approach. For example, deep learners were more likely to provide elaborate explanations that involved reference to causal relationships or personal experiences. In addition, deep learners showed a greater tendency to engage in spontaneous theorizing, ask follow-up questions as well as make predictions and resolve knowledge discrepancies. Conversely, surface learners were more shallow in their thinking, often providing answers that were reformulations of questions. Their questions were also more factual and procedural in nature compared with deep learners. In addition to this study, Chukwuyenum’s (2013) research based in Nigerian secondary classrooms further found that teachers who provided tasks in their classroom involving application of interpretation, analysis, evaluation, inference, and self-regulation skills had students who performed better on tests of mathematics and demonstrated enhanced understanding of mathematic concepts.

One debate that is of particular relevance to the development of Teach Secondary is the extent to which critical thinking skills are domain-specific or domain-general. Whilst some argue that a set of critical thinking skills exist that are general and relevant across subject areas, others hold that thinking is dependent on a specific subject knowledge and that the teaching of critical thinking skills should therefore be specific to each subject (See Abrami et al., 2015; Niaz, 1994; Tiruneh et al., 2016, for review) According to Tiruneh et al. (2016), however, the generality vs specificity debate has recently shifted towards a synthesis of the two views (Davies, 2013; Robinson, 2011; Smith, 2002, cited in Tiruneh et al., 2016). As stated, “although related content and issues differ from one domain to the next, a set of critical thinking skills that are applicable across a wide range of domains exists” (Tiruneh et al., 2016, p. 485). Abrami et al. (2015) also emphasize that the prevailing psychological view tends to favor the generic traits
approach; i.e., learning to think critically is understood as gaining mastery of a significant series of discrete skills or mental operations and dispositions that can be generalized across a variety of contexts. In addition, Niaz (1994, p. 413), within the context of science, concludes that the content-process dichotomy is misleading as the two approaches to teaching complement each other. As such, *Teach Secondary*, identifies a core set of critical thinking skills (e.g., interpretation, evaluation, inference and predicting) that have been deemed transferable across varying subject levels. Additionally, it includes an expanded thinking tasks table that demonstrates this applicability across numerous subject areas related to Language Arts, Mathematics, Biology, Physics and Chemistry.

6.3 Students perform thinking tasks

Critical thinking is an active process that involves students engaging in challenging learning tasks. As highlighted by Chukwuyenum (2013), critical thinking skills must be performed to be learnt and developed. Students who apply critical thinking skills in the classroom especially through activities involving dialogue and/or exposure to authentic or situated problems or examples derive a number of academic and psycho-social benefits (Abrami et al., 2015; Anwer, 2019; Awan et al., 2017; Chukwuyenum 2013; Fitriani et al., 2020a, 2020b). It is important to note, however, that the successful implementation of such activities can depend on a number of factors and conditions which may present challenges within a number of learning contexts. These include adequate resources and materials, a learning space and class constitution that facilitates students working actively and collaboratively on problems, sufficient time for teacher preparation of activities, regular opportunities for teacher application and student practice of such tasks, and teacher as well as student self-efficacy in undertaking such tasks (Byukusenge et al., 2022; Mansour, 2013; Tarmo, 2019).

As described above, research conducted in secondary classrooms in Nigeria has shown that students who practice critical thinking skills show enhanced understanding of concepts in mathematics and performance within the subject (Chukwuyenum, 2013). Research from Pakistan has further revealed that secondary students engaged with problem-based learning activities, whereby they applied knowledge to solve difficulties and problems collaboratively in the context of real-life situations, showed improved attainment in Chemistry across assessment dimensions of knowledge, comprehension, and application. In addition, students were found to express more positive attitudes towards learning and showed greater motivation for self-initiated learning compared with pupils involved in more passive, lecture-based lessons (Awan et al., 2017). Similar results have been seen within studies based in Indonesia where secondary students who practiced thinking tasks through problem-based learning and the predict-observe-explain method demonstrated increased self-efficacy (Fitriani et al., 2020a) as well as critical thinking skills (e.g., providing explanations, decision making and drawing conclusions) which in turn triggered enhanced achievement in Biology (Fitriani et al., 2020b).
6.4 Students explain their thinking to the teacher or ask open-ended questions

There is increasing awareness amongst educators of the importance of quality student talk in the classroom which can involve verbalizations of thinking and/or asking open-ended questions. For example, talk which involves students engaging critically and constructively with ideas facilitates their capacity to reason, provide justifications and argue from different points of view (Davies & Meissel, 2016; Kerawalla, 2015). Evidence also indicates that the use of quality talk impacts both achievement and interest in learning and that it can be enhanced through teachers’ explicit modelling of the practice (Costa & Kallick, 2004; Marin & Halpern, 2011; Otieno, 2018). The impacts of quality student talk have been demonstrated in a study conducted in Nigeria involving 100 junior secondary students examining the effect of stop, think and talk activities. Within this, students attained significantly higher performance in reading comprehension when exposed to the intervention which encouraged these behaviors and were also found to be more active in their participation in the classroom and attentive to key ideas expressed in the text (Yusuf, 2017).

In addition to explanations of thinking, the use of questions, particularly open questions, is often indicative of students’ capacity to engage in higher order thinking processes. They also provide valuable insight into students’ conceptions as well as misunderstandings, as evidenced by studies conducted in the United States (Chin & Brown, 2010) and Brazil (Aguiar et al, 2009). Chin and Brown’s (2010) study examining how students’ questions contribute to knowledge construction and relate to their approaches to learning found that higher-order ‘wonderment’ questions characterized a deep approach to learning. Students’ wonderment questions prompted themselves or their classmates to engage in higher order thinking processes including predicting, hypothesizing, and generating explanation. Basic information questions, however, reflected a surface learning approach that elicited little conceptual talk or deep cognitive processes.

Despite the powerful role that student explanations of thinking and questions have been found to play in learning and understanding, research from both the Global North and South indicates that their frequency and quality can be lacking in secondary classrooms (Ampiah, 2008; Chin & Brown, 2010; Sahlberg, 2010). A study conducted in Albania in secondary school classrooms showed that typical secondary school lessons are dominated by teacher talk and that time for student-initiated talk is about 1% of total lesson time (Sahlberg, 2010). In a study investigating how input factors, including questioning, were utilized at the classroom level to promote quality education in primary and junior high schools in Ghana, minimal time on student questions in lessons was also observed. For example, within rural schools, no instances of students asking questions were found within 60 observed schools. This was the case for both primary and junior secondary classrooms. Results from this study revealed that pupils were not motivated to ask questions and in the rare cases that they did, questions were typically lower order (Ampiah, 2008). These findings reflect trends raised in Westbrook et al.’s (2013) literature review and Tarmo’s (2016) research based
in Tanzania, as discussed above, and further highlight the need for more training opportunities for both students and teachers related to quality student talk involving explanations of thinking and questioning.

C. Socioemotional skills

In *Teach Secondary*, Socioemotional Skills includes three Elements: the extent to which the teacher fosters students Autonomy, Perseverance and Social and Collaborative Skills through peer interaction.

7. Autonomy

Learning environments that encourage student autonomy have been linked with a number of positive outcomes at the secondary level including engagement, improved psychological adjustment, confidence, motivation, and enhanced school performance (Hafen et al., 2011; Jeno & Diseth, 2014; Sakata et al., 2022). Indeed, it has been contested that the facilitation of autonomy may be the most important developmental context for adolescent growth (McElhaney et al., 2009, cited in Hafen et al., 2011). According to Hafen et al. (2011), the reason autonomy may be key to unlocking engagement in secondary classrooms is directly linked to the needs of developing adolescents. The extent to which adolescents feel they have some control over their setting allows them to feel more connected to their learning thus making them more cognitively involved, industrious and interested (Alegre et al., 2019; Blum et al., 2011; Leung, 2019; Reeve, 2009). As such, student autonomy should be placed at the forefront of secondary teaching and is one of the most effective methods for curbing typical declines in adolescent engagement. Teachers can promote student autonomy by providing students with opportunities to make choices and to take on roles within classroom learning. Teachers can further promote autonomy by creating a supportive, non-threatening environment that makes students feel comfortable expressing their thoughts and by encouraging all students’ active participation (Aziz et al., 2018).

While considerable evidence suggests that promoting students’ autonomy is beneficial for their learning and future life, there is also evidence indicating that adolescents’ capabilities to exercise autonomy and take on roles meaningfully may be limited due to their lack of experience with, exposure to and resources needed for this practice. In addition, studies centred in the Global South including within Uganda have revealed teachers’ frustrations at the limited practical demonstrations they have access to in training of how to successfully promote student autonomy (See Sakata et al., 2022, for review). These findings underscore the need for both students’ and teachers’ awareness and cultivation of specific practices which help develop student autonomy.

*Teach Secondary* therefore includes the following behaviors to measure the extent to which the secondary teacher promotes student autonomy:

7.1 *Teacher provides students with choices*
7.2 The teacher provides students with opportunities to take on roles in the Classroom
7.3 Students volunteer to participate

7.1 Teacher provides students with choices

Student autonomy can be understood and measured in a number of ways. Across studies, however, a key indicator of student autonomy is the provision of choices within a classroom. Theoretical literature relevant to both primary and secondary levels of teaching suggests that students making meaningful choices within the classroom fosters personal interest, task involvement, cognitive self-initiative, motivation, active engagement, and positive affect towards learning (Reeve, 2009). Empirical studies focused within secondary schools in the United States have also shown that allowing students to decide which books they read and giving them time to read their chosen texts improves engagement, brings about a stronger sense of identity and leads to better achievement (Morgan & Wagner, 2013). Giving pupils choice in the type of homework they complete has further been found to lead to greater intrinsic motivation in undertaking the task, higher quality work and better achievement on tests as opposed to when choices were not provided to students (Patall et al., 2010).

Three main types of teacher autonomy support have been identified which relate directly to the ways in which students are given freedom of choice within the classroom. These include: 1) organizational autonomy-support, relating to decision-making roles in classroom management; 2) cognitive autonomy-support, denoting support in students’ ownership of learning; and, 3) procedural autonomy-support, referring to student choice in the manner through which they present their work (Stefanou, et al., 2004). Of these practices, cognitive autonomy-support has been regarded as the most powerful teacher autonomy strategies for promoting deep thinking due to its facilitation of metacognitive processes whereas procedural autonomy-support has been related more to surface level learning (Stefanou, et al., 2004). From an inclusion angle, however, procedural autonomy support, as manifested through learners being given choice in the context or content used for practicing skills or the tools used for information gathering or production, is essential for enabling students of different ability levels and strengths to learn (CAST, 2018). As such, procedural autonomy support can act as a powerful promoter of inclusivity within a classroom. Due to the greater likelihood of observability within a classroom, Teach Secondary, like Teach Primary, highlights examples of cognitive and procedural autonomy support.

7.2 The teacher provides students with opportunities to take on roles in the classroom

Assigning students roles and responsibilities within classrooms is another key strategy attributed to the development of adolescent autonomy. It is also a practice that has been positively linked to a number of other cognitive and affective outcomes at the secondary level. Meta-analyses of studies from multiple contexts have shown, for instance, that adolescent students who take on roles as
peer tutors within mathematics improve their understanding and performance within the subject (Alegre et al., 2019; Leung, 2019). A study conducted in Spain has also presented evidence that taking on roles as peer tutors improves students’ self-concept within mathematics as well (Moliner & Alegre, 2020). In a study examining an innovative method of mathematics teaching known as ‘Responsive Teaching through Problem Posing,’ from the United States, secondary teachers who elevate students’ roles within classrooms by positioning them as experts in learning promoted confidence in students’ thought patterns and strategies for working out problems (Kent, 2017). Beyond the benefits to the ‘expert’ themselves, elevating the roles of students in class discussions helped improve participation of students more generally in both learning about and talking about mathematical notions. Blum et al.’s (2002) research on the use of literature circles in middle schools has provided additional evidence on how student roles can bring about positive outcomes. Within this study, literature circles, i.e., where students are assigned different roles relating to the reading of a text including discussion leader, vocabulary enricher, illustrator and connector, were found to improve self-management skills, focus, risk-taking, communication, participation as well as listening skills for students with significant learning challenges in secondary classrooms (Blum et al., 2002). Based on findings presented in this section, we have revised behavior examples in Teach Secondary to highlight the particular effectiveness of assigning students’ roles that help them support other students’ learning development in the classroom.

7.3 Students volunteer to participate

Another way that effective teachers foster autonomy is through allowing students frequent opportunities to participate. Classroom participation comprises a number of activities that can include involvement in discussion, dialogue and presentations (Aziz et al., 2018). Adegoke’s (2011) Nigerian-based research demonstrated that expanding students’ opportunities to take part in lessons led to decreased dependency and enhanced academic performance. Ideally, classroom participation should involve all students. However, some research conducted in secondary schools in Ghana and Tanzania suggests that teachers often favor volunteering students (e.g. students who have their hands raised) as well as more able students who can demonstrate learning and understanding effectively (Ampiah, 2008; Kira et al., 2013). A number of student-related internal and external factors have also been found to impact classroom participation during secondary school, with gender differences observed. A study conducted in Pakistan found that boys participated more than girls and that self-esteem enhanced boys’ willingness to take part in lessons more than girls, whereas motivation influenced girls’ participation more than boys. In addition, teachers, peers, and curriculum were factors that supported boys’ participation more than girls’, who in turn were more influenced by a supportive classroom environment. For both genders, fear was a significant factor that decreased participation in learning. A main conclusion from this research was the vital role that teachers can play in boosting participation by encouraging contributions from all students. In addition, the importance of a supportive, non-threatening and open learning environment where students feel comfortable
expressing their thoughts was seen a critical factor in students’ willingness to take part in lessons (Aziz et al., 2018). Resounding with this study’s findings, the importance of classroom environment on secondary students’ participation has also been highlighted by Hattie (2012, p. 140):

“How the student experiences the lesson is critical to engagement and success in participating in learning-more so for adolescents than elementary students (who are more content to be ‘busy’).”

8. Perseverance

Secondary teachers can play an important role in supporting students’ continuous growth and perseverance through academic challenges. At the secondary level, focusing on and praising effort and improvement, instead of only intelligence or success, can facilitate students’ growth mindset, i.e., the belief that one’s capabilities are changeable rather than fixed (Claro et al., 2016; Paunesku et al., 2015). Focusing on students’ efforts rather than capabilities is further supported by research showing secondary-aged students’ preferences for effort-focused praise (Burnett & Mandel, 2010; Folmer et al., 2008). Moreover, research from low- and high-income country settings suggest that when teachers have a positive attitude towards mistakes and frame errors as opportunities for learning, student motivation, achievement, and creativity can improve (Avele, 2016; Käfer et al., 2018). Perseverance can be further nurtured at the secondary level through goal setting which can help to not only focus and motivate students’ efforts, but also act as an effective tool to combat the well-documented decline in engagement that students can experience in the transition to and during secondary school (Burns et al., 2018).

Teach Secondary therefore includes the following behaviors to measure the extent to which the secondary teacher promotes student perseverance:

8.1 Teacher acknowledges students’ efforts – rather than focusing only on results, students’ intelligence, or natural abilities
8.2 The teacher has a positive attitude towards student challenges
8.3 The teacher encourages goal setting

8.1 Teacher acknowledges students’ efforts – rather than focusing only on results, students’ intelligence, or natural abilities

At the secondary level, praising effort and improvement, as opposed to intelligence, has been highlighted as a key strategy for promoting students’ growth mindset which has been found to positively impact learning in a number of contexts (Claro et al., 2016; Daoyang et al., 2022; Dweck, 2002). Research conducted in Chile revealed that growth mindset is a strong predictor of secondary students’ achievement across all socioeconomic levels (Claro et al., 2016). In addition, this study found that students from lower socio-economic backgrounds were less likely to hold a growth mindset than their more affluent peers, but for those that did, the detrimental effects of poverty on academic performance were buffered. According to the authors, these results suggest that
students’ mindsets may temper or worsen the effects of economic disadvantage on a systemic level (Claro et al., 2016). Related to this research, growth mindset interventions focused on helping students persist when they experience academic difficulty and understand struggle as an opportunity for growth have been associated with a decreased dropout risk of secondary school students and increased academic performance (Paunesku et al., 2015). Both these studies suggest that helping students understand difficulty in a way that fosters learning and persistence may be particularly beneficial for disadvantaged or underachieving secondary pupils whose beliefs may act as barriers to achievement (Claro et al., 2016; Paunseku et al., 2015).

Secondary teachers’ focus on students’ efforts rather than abilities has been further supported by research revealing age-relevant differences in students’ preferences for praise (Burnett & Mandell, 2012; Folmer et al., 2008). In one example from Australia, younger students (grades 1–4) showed stronger preferences for praise related to ability whereas older students (grades 5–7) tended to favor praise related to effort (Burnett & Mandell, 2010). Another example from the United States examining perspectives of effort and ability for children and adolescents aged 5–15 (Folmer et al., 2008) found that age-related differences in the understanding of effort and ability feedback led to different self-protection strategies. Specifically, younger children equated ability with hard work whereas older children felt that more able students did not need to expend much effort. These studies strongly suggest that effort should constitute the focus of positive language used with older students in order to reflect their developmental tendencies (Burnett & Mandel, 2010; Folmer et al., 2008).

8.2 The teacher has a positive attitude towards student challenges

Expressing a positive attitude towards students’ challenges has been identified as an important component of effective teaching that helps develop perseverance and students’ ability to learn. For example, Käfer et al.’s (2018) German based study revealed that teachers’ positive attitude towards mistakes, teachers’ positive response to student mistakes and students’ perception of mistakes as opportunities for learning increased both individual student motivation and achievement in English language classes. These findings resounded with previous evidence showing secondary students who perceive their teachers’ attitude as supportive and ‘error-tolerant’ report a positive perception of their teachers’ affective behaviors in error scenarios and express less fear when making mistakes (Heinze & Reiss, 2007; Rach et al., 2013). In addition to these studies, research from Ethiopia has identified the allowance of mistakes and encouragement of learning from mistakes as critical practices for fostering students’ creativity in learning (Ayele, 2016).

Whilst expressing a positive attitude towards student challenges has been linked to desirable cognitive and affective outcomes, research has shown that many teachers at the secondary level can place little emphasis on the learning potential of errors (Santagata, 2015; Tulis, 2013). Tulis’ (2013) study based in secondary schools in Germany, for instance, found that whilst classroom routines were dominated by adaptive error management, only few interactions between
teachers and students emphasized mistakes as learning opportunities or reinforcement of error risk taking. Interestingly, this study also revealed subject level differences between teachers’ responses to student mistakes with mathematics teachers showing a greater likelihood to give discouraging or humiliating error responses and a lower likelihood to emphasize mistakes as learning opportunities compared with language arts and economics teachers. A major implication of this research is the need to strengthen secondary teachers’ awareness of the importance of expressing positive attitudes towards student difficulties and set-backs across subject areas and learning contexts.

8.3 The teacher encourages goal setting

A substantial body of research attests to the importance of students setting personal goals as well as teachers’ encouragement of this practice (e.g., Andriessen et al., 2006; Idowu et al., 2014; Moeller et al., 2014; Rowe et al., 2012; Zimmerman, 2008). Research conducted in secondary classrooms in Nigeria has shown that goal setting significantly impacts performance in the English language. According to the authors, this is because once a goal is set, the student has a direction: they are focused and determined to achieve their goals (Idowu et al., 2014). These findings have been echoed in Moeller et al.’s (2014) longitudinal study from the United States which found that teachers who guide students in setting individual goals during secondary school witness increased achievement in Spanish language classrooms five years on.

Alongside this evidence, a number of differences in goal setting behavior between children and adolescents have been identified. Research from the United States has shown that older adolescents generally hold more goals than younger children, an unsurprising finding given the significant cognitive and psychosocial changes that occur during this period (Galotti, 2005). This was also found to be the case for disadvantaged out-of-school populations in Nigeria, suggesting that a stronger orientation towards the future is a developmental tendency for adolescents across contexts (Olasupo & Idemudia, 2016). In addition, older adolescents tend to generate more complex goals than younger students, i.e., ones that require more effort and resources to achieve (Galotti, 2005). This evidence suggests the importance of secondary students being supported in the development of other self-regulatory strategies (e.g., planning and strategy implementation), a practice that has been reflected within behavior examples of Teach Secondary. Finally, the well-documented decline in engagement that students experience in the transition to and during secondary school has been cited as another reason to emphasize personal goal setting with adolescent students. As stated by Burns et al (2018), it is important to examine motivational strategies that may help impede this decline and goal setting is a powerful technique that has been found to predict not only higher initial engagement but continued investment in learning.

9. Social and Collaborative Skills

Social and emotional development are heightened during adolescence, making the support of socioemotional and collaborative skills a core concern of
secondary educators’ work. Secondary students have been found to experience more frequent and intense emotions than younger students and this period of development is often when affective and behavioral problems increase substantially (Hasekiu, 2013; Mosia, 2015; Silk et al., 2003). Learning emotional regulation at this time can mitigate some of these challenges and help young people develop a strong sense of identity (Jankowski, 2013). Fortunately, evidence from the Global North and Global South has shown that secondary teachers can play a powerful role in influencing and supporting students’ socioemotional and interpersonal skills (e.g., Mosia, 2015; Lizarraga et al., 2003). Moreover, secondary teachers can support students to collaborate productively with their peers in group settings and, as a result, enhance pupils’ socio-emotional capacities, critical thinking skills, and academic achievement (Fung et al., 2014; Fung et al., 2017; Layne et al., 2008; Olanrewaju, 2019; Oludipe, 2012). While there is a strong evidence base supporting the encouragement of social and collaborative skills in the classroom, it is important to note that cultural variations often exist in what social and collaborative skills are valued and how they are manifested in different cultural contexts (Jukes et al., 2018). This finding highlights the need to carefully consider local perspectives when utilizing frameworks such as Teach Secondary for the measurement of these skills. Teach Secondary includes the following behaviors to measure the extent to which the secondary teacher promotes students’ Social and Collaborative Skills:

9.1 The teacher promotes students’ collaboration through peer interaction
9.2 The teacher promotes students’ interpersonal skills such as perspective taking, empathizing, emotion regulation, and social problem solving
9.3 Students collaborate with one another through peer interaction

9.1 The teacher promotes students’ collaboration through peer interaction

Evidence from both the Global North and South has shown that secondary teachers who encourage student collaboration through peer interaction are able to enhance pupils’ socio-emotional capacities, critical thinking skills as well as academic achievement (Fung et al., 2014; Fung et al., 2017; Layne et al., 2008; Olanrewaju, 2019; Oludipe, 2012). Within the secondary classroom, structured student collaboration can take on many forms including cooperative learning (i.e., where students work together interdependently in small groups towards a common objective) think-pair-share activities, peer tutoring and literature circles, all of which have been linked to positive student outcomes (Alegre et al., 2019; Bamiro, 2015; Blum et al., 2002; Fung, 2016; Leung, 2018; Oludipe, 2012). Research conducted in junior secondary schools in Nigeria, for example, has revealed that students in two cooperative learning strategy groups (Learning Together and Jigsaw II) had higher immediate and delayed academic achievement in science compared to students learning within conventional-lecture settings. Other research conducted in Nigeria has shown that secondary students exposed to collaborative learning opportunities significantly improved

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6 Teach Secondary, as with other versions of the tool, has a modular framework that allows for a comprehensive assessment of teaching quality that can be adapted to different cultural and educational settings. For an example of how this has been done within the Rwandan secondary education context, please refer to Ani-Asamoah et al., 2020, p. 5.)
their mathematical achievement and also reduced their mathematical anxiety, compared with students not exposed to these activities (Olanrewaju, 2019).

Despite adolescents’ increased independence and more developed cognitive capacities during adolescence (Sanders, 2013), research demonstrates that teachers can do much to enhance the quality of student collaboration within the classroom. For example, Fung et al.’s (2017) research from Hong Kong compared three learning conditions including: whole class teaching approach, group work without specific strategies and group work with effective strategies on learning related to a ‘space travel’ unit in science. Of all these scenarios, group work with effective strategies not only improved test achievement, but also enhanced students’ joint construction of conceptual knowledge in science. Whilst the benefits of students working collaboratively have been well-documented, research also tells us of the challenges that teachers can face in implementing this practice in their classrooms. For example, evidence from Kenya has revealed that teachers perceive large class sizes with restricted space as limiting the extent to which collaborative work involving student-student interaction can be implemented (Ndethiu et al., 2017). Staples (2008) has also written of how differences between students’ prior attainment, experiences with mathematics, level of academic success and proficiency with study skills can impact group dynamics during collaborative work within mathematics classrooms. In addition, social dynamics can bring added complexity, especially at the secondary level, with unequal participation or marginalization posing a significant threat to effective group work.

Despite these challenges however, research has shown that group work can be highly effective in a range of socio-cultural settings at the secondary level, provided that teachers support its implementation effectively. For example, when group work skills were integrated into secondary classrooms in Trinidad and Barbados, which tend to use more traditional methods rather than social pedagogical methods, all pupils were found to improve their attainment, notably the lowest performing students (Layne et al., 2008). Interestingly, teacher’s conception of a ‘good pupil’ also shifted when this practice was employed, with more value placed on the importance of social inclusion and the relational/group working skills among pupils. Westbrook et al.’s (2003) review has also highlighted how effective group work can be in secondary classroom settings in developing countries for encouraging discussion, argumentation, and student-student interaction, despite limited resources and the high level of student heterogeneity, not only in terms of ability, but also age.

9.2 The teacher promotes students’ interpersonal skills such as perspective taking, empathizing, emotion regulation, and social problem solving

The development of students’ interpersonal skills including perspective taking, empathizing, emotion regulation and social problem solving, is a core concern of secondary educators. Research relating to emotion regulation has revealed that emotions are heightened during the period of adolescence, with older individuals experiencing more frequent and intense emotions than younger individuals. In addition, this stage of development is seen as one of increased risk, in that
affective and behavioral problems tend to increase substantially, particularly for adolescents who have more intense and labile emotions and less effective regulation of these emotions (Silk et al., 2003). Relatedly, evidence from both the Global North and South suggests that bullying increases in frequency as well as severity at the secondary level, with the highest prevalence observed at the start of secondary school. As students get older, bullying also becomes more covert, with verbal and relational bullying being most frequent (Hasekiu, 2013; Mosia, 2015).

Within education literature, the positive psychosocial and cognitive benefits of having developed interpersonal skills are well documented. For example, research has demonstrated that adolescents who are able to successfully regulate their emotions have a more secure sense of identity, whereas those who face difficulties in this area experience identity foreclosure, i.e., prematurely adopting an identity that doesn’t reflect one’s true sense of self. As such, emotion regulation and particularly emotion awareness have been found to play a significant role in the development of identity for secondary students (Jankowski, 2013). Research has also revealed that secondary students who are able to maintain positive emotions when learning mathematics are better at metacognitive strategy use (Peklaj & Pečjak, 2011). Similarly, students’ negative emotions have been found to strongly impact Grade Point Average in 9th Grade as well as completion of upper secondary school (Klapp, 2016).

Evidence has also highlighted the powerful role that teachers can play in influencing and developing students’ interpersonal skills. In experimental research from Spain examining the effects of teaching self-regulation strategies and social skills through the use of assertiveness and empathy to resolve interpersonal classroom conflicts, for instance, students exposed to the treatment group had significant gains in self-regulation, self-control of behavior in interpersonal interactions, assertiveness, empathy and consideration towards others. In addition, students exposed to explicit teaching of interpersonal skills showed impressive progress in socially related factors. For example, students began to: share their ideas, interests and feelings without hurting others’ feelings; relate to others’ viewpoints and emotions; interact with peers more easily; and, demonstrate concern about issues their peers were facing (Lizarraga et al., 2003).

Research from the Global South has also underscored the influential role of teachers in this domain as well as the urgent need for teacher modeling of positive behaviors in secondary classrooms. A study in Lesotho reporting a high prevalence of bullying in high schools found that teachers were mainly reactive rather than proactive in dealing with students’ negative behavior towards their peers. This study highlighted teachers’ preference for using corporal punishment to control bullying, a practice that, according to the author, unwittingly reinforces bullying due to teachers’ modeling of the use of force to get a desired response (Mosia, 2015, p. 176). Some teachers within this study were also found to ignore bullying, particularly verbal forms, which similarly acts as a reinforcement to bullies. A major implication of this study was the need for teachers’ positive modeling of how to manage frustrating emotions and for
teachers to provide guidance on skills that can help secondary students address their everyday social challenges (Mosia, 2015).

9.3 Students collaborate with one another through peer interaction

While evidence demonstrates the numerous benefits of group work in secondary classrooms, this is highly contingent upon how effectively students work together. For example, research in Nigeria has shown that when friendliness and cooperativeness is established within groups, students are motivated to learn and more confident to ask questions to one another (Olanrewaju, 2019). There is also much evidence to demonstrate that group work, including peer tutoring and cooperative learning, can be a powerful promoter of inclusion within the classroom at both primary and secondary levels of schools when students collaborate and help one another (Makoelle, 2014; Mitchell, 2019).

Often, however, students experience difficulties during group work, which can lead to a lack of engagement, participation and learning in these contexts. Within Ethiopia, for example, the use of student networks—a cooperative learning strategy whereby students of different achievement levels, genders and ethnicities work in small groups—has presented a number of challenges for adolescents in upper primary and secondary grades. For example, ‘belittling’ can often occur in these settings (e.g., towards students who are poorly dressed), therefore challenging the healthy functioning of the group work (Weldemariam et al., 2015). Research from Vietnam has also revealed four common issues encountered during group work that can present obstacles to teaching and learning (Le et al., 2017). These include: students’ lack of collaborative skills (e.g., accepting opposing viewpoints and negotiating); free riding (unequal participation in group tasks); competence status (relating to the greater influence of high-status group members), and friendship (personal relations that can inhibit the extent to which students work seriously). Linked to these obstacles are three antecedents that are largely characterized by a strong teacher focus on the cognitive aspects of collaborative learning, which can lead both teachers and students to overlook the importance of the collaborative aspects. These antecedents relate to the nature of the collaborative learning goals, instruction, and assessment set by the teacher.

Evidence demonstrating the criticality of effective social interactions for group work at the secondary level can also be seen in by Pang et al.’s (2018) examination of the collaborative learning experiences of secondary school students in Singapore. This study revealed that students’ dissatisfaction when working in groups largely stems from poor interpersonal engagement throughout the group work process. When asked to reflect on their collaborative learning experiences, for example, students expressed that their peers were often “uncooperative” or “lame”, and that they would rather “get it (the group work) over and done with.” These statements showed an inability to build social competence, with students choosing to avoid or blame one another when they encountered problems rather than to engage another group member. Taken together, these studies reveal that secondary educators often take for granted that effective collaborative learning will naturally ensue when students are given
group work, which is frequently not the case. Results from these studies highlight a need for teachers to balance the cognitive and collaborative aspects of group work. This is particularly important for secondary students, given their developmental changes and increased concern with peer-peer relationships and social status (Smith, 2009). It is also a practice that has been reflected in Teach Secondary.

Section 4: Discussion and Conclusion

This literature review has outlined Teach Secondary’s organizing framework and the empirical evidence which supports each aspect of the tool. Literature presented has highlighted the strong potential that effective teaching practices can bring for improved student learning and affective growth at the secondary level. It has also underscored the importance of a “Whole Child Development” approach and relatedly the criticality of supporting adolescents’ social emotional skills. Within this review, evidence from LMICs within secondary settings has been forefronted, as has literature relating to the psycho-social development of adolescents which supports the adaptation of Teach Secondary from the earlier Teach Primary version. It is hoped that the provision of a common framework for understanding quality secondary teaching will contribute to improved training and support for secondary teachers as well as the professionalization of secondary teaching, particularly within LMIC contexts.

To help promote improved student learning within secondary schools, Teach Secondary has been created to be scalable within LMIC contexts. Additionally, and as also described within this review, Teach Secondary is freely available and can be implemented by non-expert observers. This accessibility is intended to help inform education stakeholders and policymakers of existing gaps as well as strengths relating to both process and structural quality within the secondary school contexts in which they work, in order to develop interventions, policies, training opportunities and programs which are more tailored to local needs.

As presented within this review, Teach Secondary has undergone an extensive development process which has included a comprehensive review by experts including academics and practitioners who are focused upon improving secondary education within LMICs. To date, countries of application have included Rwanda, Guyana, Uganda, Tanzania, Nepal, Kenya, and Sierra Leone. Teach Secondary is also currently being piloted within Andhra Pradesh, India and will soon be validated using data from this context. These activities along with further feedback from the Teach Secondary Expert Panel Review, will help inform of any needed revisions to the instrument and ultimately provide an opportunity to ensure the tool’s sustainability for low- and middle-income countries.

Lastly, while the evidence presented within this review has provided justification and support for the Teach Secondary framework, it is hoped that future data and learnings generated from the tool with allow for continued refinement of the instrument as well as enhanced awareness of what constitutes teaching quality at the secondary level.
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