Chapter 2
What Does 'Teacher Effectiveness' Look like?

Abstract Making selection decisions is, at its heart, a prediction about future effectiveness. For teacher training, the key predictive question is, Will this applicant succeed in our program? For teaching jobs, the central predictive question is, Will this applicant have a positive influence on student achievement and wellbeing? In this chapter, we provide a working definition of teacher effectiveness and explore theories and models of teacher effectiveness. Next, we consider the challenges inherent in measuring teacher effectiveness, with a look at value-added approaches, classroom observations, and student ratings. Understanding how teacher effectiveness changes over time raises important implications for teacher selection, and building our knowledge about the academic, psychological, and even financial outcomes of selecting the most effective teachers is crucial to building the teacher workforce.

Making selection decisions is, at its heart, a prediction about future effectiveness. For teacher training, the key predictive question is, *Will this applicant succeed in our program?* For teaching jobs, the central predictive question is, *Will this applicant have a positive influence on student achievement and wellbeing?* There is no shortage of research showing that teachers make an important contribution to academic outcomes (e.g., Fauth et al., 2019; Hanushek, 2014; Kane et al., 2008; Rivkin et al., 2005), and we know there is considerable variation in how much individual teachers contribute to these outcomes (e.g., Atteberry et al., 2015; Xu et al., 2015). However, defining teacher effectiveness can be challenging because teaching is complex, and teacher behaviors do not necessarily influence student outcomes in a direct or linear fashion (Skourdoumbis & Gale, 2013). Furthermore, not very much is known about the trajectory of teacher effectiveness: how it can be identified in applicants, how it develops through training, and how it changes over time. In this chapter, we explain what we mean by *teacher effectiveness*, and explore its conceptualization, its development over time, how it varies from person to person, and how it might be measured in ways that are reliable and valid.

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2.1 Teacher Effectiveness

We define 'teacher effectiveness' as the extent to which teachers carry out the socially-agreed objectives associated with the job, primarily, but not exclusively, pertaining to student learning (Campbell et al., 2003). The definition recognizes that teachers are evaluated first and foremost on the impact they make on students' learning, but also that other outcomes—social, professional/collegial, community-related—are secondarily associated with effectiveness. The current focus on evaluating teacher effectiveness through measuring student achievement gains or through observing specific lessons using systematic observation protocols captures important aspects of teacher effectiveness, i.e., student learning, but also misses other, more nuanced aspects of teaching.

Teacher effectiveness includes an interaction of personal characteristics and behavior; that is, who the teacher *is* (individual attributes, background factors, teaching-related experiences) and what a teacher *does* (i.e., behaviors in the classroom that include teaching and assessment strategies, ways of relating to students, peers, and the community). Our primary interest in this book is in exploring the individual attributes or personal characteristics that influence t*eacher effectiveness*, rather than examining teaching behaviors that comprise the broader category of *effective teaching.* There is no shortage of research on effective teaching practices (e.g., the RAND report on teacher effectiveness; Stecher et al., 2018), but researchers in education and psychology have paid less attention to studying the personal characteristics of effective teachers. We recognize the critical importance of studying the behaviors that underpin effective teaching—the strategies used, the assessment approaches adopted, and the preparation and planning supporting effective teaching—but our key interest is in understanding the general and particular characteristics that lead to these teaching behaviors, especially when we consider how important teacher effectiveness is to student outcomes.

Hattie's meta-analysis on student achievement outcomes. How important is teacher effectiveness to student outcomes? Hattie's synthesis of over 800 meta-analyses related to students' academic achievement (Hattie, 2009; also see Hattie & Zierer, 2019) summarizes the relative contributions from the student, from the home, the school, and from the curriculum. His 'barometer of influences' rates the relative influence of the major contributors to learning, with four categories: reverse effects, describing interventions in which the students actually *lose* progress ($d = -0.20$ to -0.10), developmental effects, where the factor does not make much more of an impact than the expected maturational improvement ($d = 0.0$ to 0.15), teacher effects ($d = 0.15$ to $d = 0.40$) where the effect is similar to the education gains typically accomplished with a teacher in a school year, and zone of desired effects ($d > 0.40$), for the influences that have the greatest impact on student learning.

Table 2.1 presents the ranking of average effects from each of the major contributors to learning, with 'teacher' factors ranked first, with a mean effect size of $d = 0.49$, followed by effects from the curricula, from teaching (i.e., teaching practices), and lesser effects from student, home, and school factors. Many of the key

Table 2.1 Average effects for contributions to student achievement (adapted from Hattie, 2009)

Contribution	# of meta-analyses	*d*	*SE*
Student	139	0.40	0.044
Home	36	0.31	0.058
School	101	0.23	0.072
Teacher	**31**	**0.49**	**0.049**
Curricula	144	0.45	0.076
Teaching	365	0.42	0.071
Average	136	0.40	0.062

Note For educational outcomes, effect sizes can be classified as small ($d = 0.20$), medium ($d = 0.40$), and large ($d \geq 0.60$)

within-teacher variables included in Hattie's analyses include individual attributes such as the expectations teachers hold about their students' academic potential, with other variables focusing on teaching behaviors in the classroom. Student achievement results from a complex interaction of environmental factors, within-person factors, and behavioral factors.

The '*What makes great teaching?*' report. A 2014 report focused on teaching effectiveness—*What makes great teaching?*—provides one way to understand factors related to successful teaching. Coe et al. (2014) defined teaching effectiveness as teaching which leads to "improved student achievement using outcomes that matter to their future successes" (p. 2). The authors of the review focused primarily on factors related to teachers and teaching, with an emphasis on classroom factors associated with measurable student achievement. Six evidence-supported components of effectiveness were included in their general framework for teaching quality: pedagogical content knowledge, quality of instruction, classroom climate, classroom management, teacher beliefs, and professional behaviors. The authors found *strong evidence* of impact on student outcomes for (a) pedagogical content knowledge and (b) quality of instruction, with *moderate evidence* of effectiveness for (c) classroom climate and (d) classroom management, and *some evidence* of effectiveness for (e) teacher beliefs, and (f) professional behaviors. Although it is difficult to separate teachers' individual attributes from their teaching practices, the Sutton Trust review suggests that a wide range of factors are related to effective teaching.

Kunter's COACTIV model. Teacher effectiveness is dynamic, because it changes over time as teachers gain experience and learn new approaches to engaging with students. But teachers vary widely in their effectiveness (Atteberry et al., 2015), and these inter-individual differences are influenced by the interaction between individual attributes and external factors. The COACTIV model of teacher effectiveness is built on a *dynamic interactionist view* in which individual attributes interact with contextual and background factors to influence student outcomes (Kunter et al., 2013). This view of teacher effectiveness recognizes that inter-individual differences in teacher effectiveness may be related to individual attributes or to background or contextual factors. Teacher effectiveness is formed through the interaction

between individual attributes, relevant experiences, and learning opportunities. In Kunter et al.'s model, learning opportunities include informal (learning by doing) opportunities as well as formal activities, such as those presented in initial teacher training and professional development. Their work is built on the notion that teachers' competence exists as a continuum (e.g., Krauss et al., 2020) and develops over time, influenced by individual attributes that are evident at entry into training and practice (Kunter et al., 2013).

Figure 2.1 presents an adapted version of the COACTIV model. In the model, the broad educational and social environment (contextual factors) have an overarching influence on all aspects of teaching and learning through its relationship with learning opportunities, teacher effectiveness (comprised of professional competence and practice), and student and teacher outcomes. Teachers' individual attributes include those that are malleable and likely to change over time (e.g., pedagogical knowledge) and those that are more trait-like and resistant to change (e.g., personality). These individual attributes provide a foundation that does not just influence professional competence and professional practice, but also influences how teachers engage in available learning opportunities. The adaptation of Kunter et al.'s model provides a theoretical explanation of variations in teacher effectiveness, by noting how individual attributes influence teacher effectiveness, resulting in differential effects on student and teacher outcomes.

Individual differences in teacher effectiveness. The COACTIV model acknowledges the ways in which individual attributes contribute to variation in teacher effectiveness. The evidence for variation in teacher effectiveness is strong, yet school systems are often reluctant to publicly acknowledge variation in teachers' effectiveness (Paufler & Sloat, 2020; Weisberg et al., 2009). The pattern of argument

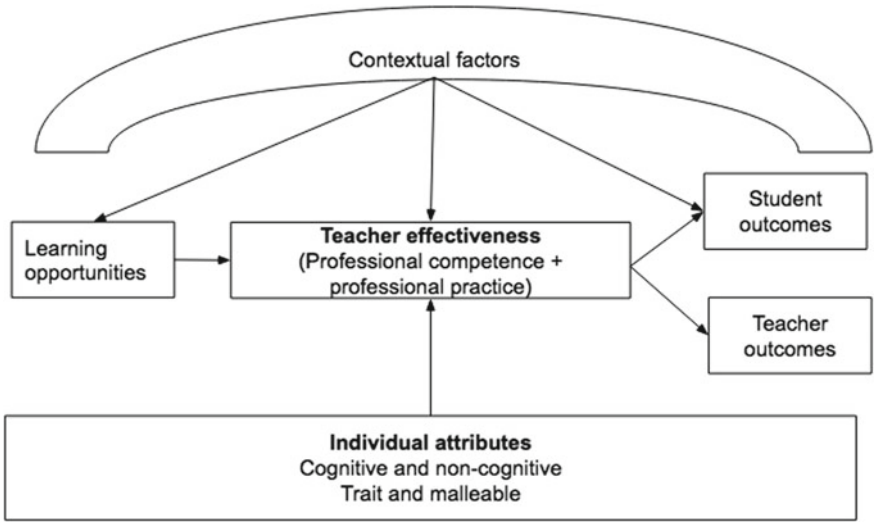

Fig. 2.1 Model of teacher effectiveness (adapted from Kunter et al., 2013)

between those protecting teachers' interests and those operating school systems is well known, with one side arguing that arbitrary and unreliable measurements of effectiveness threaten teachers with potentially arbitrary and discriminatory employment practices, and the other side arguing that accountability is needed to identify cases of good and exceptionally poor practice. The argument that teachers are all equally effective was termed by Weisberg et al. (2009) the *Widget Effect*, defined as the belief that teachers in a system function as identical, interchangeable parts, with no difference in instructional effectiveness. In their study of 12 American school districts in four states, representing approximately 15,000 teachers, they found that almost all teachers were rated as either *good* or *great*, excellence was unrecognized, and poor performance was mostly unaddressed. In almost all school districts, no meaningful information on teachers' strengths and weaknesses was collected, and the effectiveness data that were collected were almost never used for selection (or retention) purposes.

Consideration of variation in teacher effectiveness is especially important when evaluating new teachers at the point of selection into training and employment. Hiring a new teacher represents a career-long investment of at least two million dollars (Goldhaber et al., 2014), meaning that selecting a less effective teacher represents a costly mistake. Typically, beginning teachers become more effective in the first few years of their careers, thus a selection process is more about predicting an effectiveness trajectory than predicting effectiveness in the first year alone. Staiger and Rockoff (2010) estimated that students in the classroom of a first-year teacher gain 0.06 to 0.08 standard deviations of achievement in mathematics and language arts less than similar students assigned to experienced teachers. A recent systematic review of the research on the relations between teacher experience and effectiveness (Podolsky et al., 2019) found that almost all studies (28/30) showed a positive and significant association between experience and effectiveness, with effectiveness rising sharply in the first few years of a career, with a continuing upward trajectory into the second (and often) third decade of teaching. However, the validity of measures of teacher effectiveness is often disputed, largely due to the complexity of the job.

2.2 Measuring Teacher Effectiveness

Measuring teacher effectiveness presents one of the greatest challenges for researchers and policymakers because teacher effectiveness depends on a complex interaction between teachers x students x subject x school. It can be difficult to reliably measure one factor in the interaction. In 1917, Pittenger, writing in the *Journal of Educational Psychology,* spoke of *teacher measurement*, referring to the development of a consistent manner of measuring the "qualities of teaching merit" (p. 103). Pittinger recognized that "there are those who believe that the movement toward teacher measurement is a monstrous innovation, which threatens the holiest traditions of the education profession" (p. 103). But measuring teacher effectiveness can play an important role in sustaining healthy school systems: understanding

how and when teachers are most effective can lead to targeted professional development offerings, improved instructional practices, and a less biased understanding of teacher effectiveness.

Assessment of teacher effectiveness can take on a range of forms, with some methods (e.g., classroom observations, value-added models, student ratings) showing stronger validity evidence than other methods (e.g., principal judgment, teacher self-reports, and analysis of teaching portfolios (Coe et al., 2014). The use of value-added models of teacher effectiveness is gaining increased exposure, but is contested, with particular concern that value-added models fail to adequately account for differences in student backgrounds (e.g., Darling-Hammond, 2015). Other approaches to measuring teaching effectiveness involve the use of systematic classroom observation tools, such as the CLASS framework (e.g., Pianta & Hamre, 2009), which assesses teaching behaviors including emotional support, classroom organization, and instructional support. Assessment of teaching behaviors using instruments such as the CLASS has been shown to be robust and of benefit for designing interventions aimed at enhancing teaching practices.

In the next section, we describe three different approaches to measuring teacher effectiveness, and although far from exhaustive, the list covers some of the most-researched and discussed approaches.

Value-added approaches. The idea of using value-added measures of teacher effectiveness reduces a complex calculus of interactions to a simple-to-understand equation: teacher effectiveness = gains in student achievement. A value-added approach evaluates the impact of teachers on students' standardized test scores. Increasingly popular—and controversial—especially in the United States, value-added approaches control for relevant student factors such as prior test scores and demographics, and purport to provide an unbiased measure of the causal impact of teacher effectiveness. The approach is conceptually appealing: if teacher effectiveness can be reliably and validly separated from other environmental influences on student learning, then it is possible to identify the teachers that are having the most (and least) impact in the classroom. The work of influential American educational economists such as Raj Chetty, Jonah Rockoff, Thomas Kane, and Douglas Staiger have been influential in establishing the prominence of value-added approaches for teacher evaluation. Value-added scores are used to rate and rank teachers, and to make personnel and funding decisions.

Not surprisingly, value-added methods for teacher evaluation have met with strong opposition from those closely aligned with the profession. Although it is widely acknowledged that value-added methods are preferred over static measures of student learning outcomes because they capture change over time, the use of value-added methods to evaluate relative teacher effectiveness has been a cause for concern (American Educational Research Association, 2015). The approach is based on a set of assumptions that are frequently violated: (a) that student achievement is measured in a reliable way by standardized tests, (b) that individual teachers are the key contributors to students' learning over the time period measured, and (c) that students are randomly assigned to teachers in and across schools (Darling-Hammond, 2015). Critics raise questions about the stability of value-added scores:

teachers show a high level of annual fluctuation in value-added performance, with half of teachers in the bottom 20% of rankings in one year scoring in the top half in the following year (Darling-Hammond, 2015). Although value-added approaches are intuitively appealing, other approaches using observational approaches have gained in popularity as a way to measure teacher effectiveness.

Classroom observations. One of the most widely implemented approaches to measuring teacher effectiveness is observation of teachers in the classroom (Coe et al., 2014). Unstructured observations are regularly used by school principals to monitor the quality of instruction being delivered in a school. More formal classroom observation systems are used to make judgments about teacher effectiveness. One of the most widely used classroom observation tools is the CLASS (Classroom Assessment Scoring System) developed by Pianta and Hamre (2009). The CLASS, administered by trained observers, measures three factors of classroom teaching: emotional support (classroom climate, teacher sensitivity, and empathy for student perspectives), classroom organization (behavior management, productivity, and instructional organization), and instructional support (quality of classroom feedback, concept development, and communication). The CLASS instrument, unlike other observation protocols, differentiates between primary, middle school, and secondary school contexts, with different versions of the instrument for each context, with stronger evidence for predictive validity in the early years (e.g., Sandilos et al., 2019).

Another well-validated observation system is Danielson's *Framework for Teaching* (FfT; Danielson, 2007). The framework evaluates four aspects of effective teaching: planning and preparation, classroom environment, instruction, and professional responsibilities. The FfT does not provide explicit observation protocols in the same way as the CLASS measure, but rather offers a categorization of teaching practices that are deemed to be supportive of effective teaching. Unlike the CLASS instrument, the FfT does not differentiate between different levels of teaching (e.g., primary and secondary). Studies examining the validity of the FfT show mixed results, with some studies showing positive correlations with student achievement gains (e.g. Gallagher, 2004) but other studies showing more equivocal results (e.g., Kimball et al., 2004; Sandilos et al., 2019).

Recent work in the Netherlands has focused on developing a teacher observation method—the International Comparative Analysis of Learning and Teaching (ICALT)—that includes six domains of teaching behaviors: safe learning climate, classroom management, clear instruction, activating teaching methods, learning strategies, and differentiation (van der Lans et al., 2017). The ICALT offers a unique perspective among teacher effectiveness measures; it is situated in Fuller's (1969) three-stage theory of teacher concerns which proposes that teachers proceed through developmental stages as they progress through their career. In the first stage, according to Fuller, teachers are primarily concerned with the self; secondly, teachers are concerned with the 'tasks' of teaching; and finally, teachers are concerned with the impact on student learning. Under the umbrella of this developmental perspective, the van der Lans et al. study used Rasch modeling to show that the ICALT content was ordered in a way that was congruent with Fuller's stage model of teacher development.

Classroom observations are subject to several methodological problems, even when systematic approaches are implemented. Pre-existing beliefs about the teacher or teaching methods can bias an observer's perspective, with *halo effects* (the tendency for overall impressions of a person to influence observation ratings) and other biases potentially influencing observation scores. Furthermore, the reliability and generalizability of observations can be suspect if based on a modest number of observations (Muijs, 2006).

Student ratings. Most teacher observation systems use 'expert' observers to carry out ratings of teacher behaviors, but another approach is to use a different kind of 'experts'; that is, students in the classroom. Researchers in the Measures of Effective Teaching (MET) project, funded by the Bill and Melinda Gates Foundation, used the Tripod survey instrument (developed by Ferguson), which assesses students' perceptions of the classroom environment (e.g., Ferguson, 2009). The Tripod surveys consist of 36 items divided into seven categories (7Cs): Care, Control, Clarify, Challenge, Captivate, Confer, and Consolidate. Table 2.2 provides example items from the elementary (i.e., primary) version of the survey.

Reliability within each of the categories was strong (in the range of 0.80), and validity, measured as the relationship with teacher value-added measures, was significant. The relationship with teacher effectiveness measures varied according to category. In the validation study, the Tripod categories that were most strongly correlated with student achievement gains in English and mathematics were 'control' and 'challenge', with raw correlations of 0.22, and disattenuated correlations (i.e., corrected for measurement error) around 0.40 (Kane & Cantrell, 2010). A recent factor analysis of the Tripod (Wallace et al., 2016) found little support for the stability of the proposed seven factors but did find that student ratings of teacher behavior and the classroom environment were associated with teachers' value-added scores. Measures other than the Tripod have been developed and used in other contexts, with, for example, Kyriakides' (2005) student rating protocol showing significant correlations with student achievement gains in Cyprus.

Measuring teacher effectiveness can be conducted in a range of ways, but classroom observation, value-added models, and student ratings have a stronger evidence base than other approaches, such as principal judgments, teacher self-reports, or

Table 2.2 Examples of items from the Tripod measure of student perceptions of teacher effectiveness (elementary version)

Category	Example Item
Care	*I like the way my teacher treats me when I need help*
Control	*Our class stays busy and does not waste time*
Clarify	*My teacher explains difficult things clearly*
Challenge	*My teacher pushes everybody to work hard*
Captivate	*School work is interesting*
Confer	*My teacher wants us to share our thoughts*
Consolidate	*My teacher takes the time to summarize what we learn each day*

analysis of teacher portfolios (Coe et al., 2014). Using a triangulation approach with multiple evidence-supported measures provides the best chance of accurately capturing teacher effectiveness.

2.3 Trajectories of Teacher Effectiveness

Researchers have posited that teacher effectiveness tends to improve with experience, but only to a point (Rockoff et al., 2011), with new teachers becoming more effective as they gain experience, but with the 'experience effect' declining after the first few years of teaching (Hanushek, 2014). Recent reviews of the research challenge this truncated teacher growth theory, with Podolsky et al. (2019) proposing that effectiveness continues to increase into the second and third decades of teaching experience. Jackson et al. (2014) considered teaching effectiveness as the ability to increase students' "stock of human capital" (p. 802) through teaching behaviors such as communication with students, classroom management, or encouragement of greater efforts.

Although many new teachers gain effectiveness over the first few years of their careers, others succumb to the 'reality shock' phenomenon experienced during the first one or two years of teaching, and leave the profession (Ingersoll, 2001). Although there are many causes of new teachers' reality shock—socialization into the profession, unexpectedly heavy workload, difficulties with teacher-student interactions—being unprepared to manage classroom disturbances is a major cause of the phenomenon (Dicke et al., 2015). Teachers may overcome the initial shock of facing classroom realities through a combination of targeted interventions (e.g., Dicke et al.), or through increases in expertise that come with classroom experience.

Most teachers increase in effectiveness over time, but research that follows the trajectories of beginning teachers shows that *relative* effectiveness may be stable; that is, new teachers' effectiveness can vary substantially. Predicting heterogeneity in teacher effectiveness is at the heart of the selection process because it represents an attempt to predict which teachers will show the highest, and most stable levels of improvement in effectiveness, especially at the beginning of a teaching career. Uncovering the within-teacher factors that lead to teacher effectiveness is at the heart of the teacher selection process.

Atteberry's work on effectiveness within large cohorts of new teachers shows that *relative* effectiveness is stable (Atteberry et al., 2015); that is, new teachers' initial effectiveness is predictive of future effectiveness, especially for those who initially display the highest and lowest levels of effectiveness. The researchers collected value-added student data in mathematics and English language arts from the classrooms of over 3000 teachers in New York during the first five years of their careers. After dividing the sample into quintiles of initial performance, the researchers compared the performance of teachers at each quintile over the next five years.

The key finding from the study was that, on average, initial job performance measured after the first year of teaching predicted teacher effectiveness in years 2–5,

and that the effect was more predictive than education or SAT (university entrance) scores. On average, the most effective teachers in the first year retained their effectiveness relative to their peers over time; the least effective teachers tended to stay in that group over time. The effectiveness trajectory of low- and high-performing teachers over time was not perfect—some of the lower performing teachers became higher performing, and some higher performing teachers became lower performing—but the pattern of consistency of effectiveness was stable for the group overall. Atteberry et al. (2015) concluded that accurately identifying the effectiveness of early career teachers had the potential to dramatically improve educational outcomes for students.

The finding of stable patterns of teacher effectiveness—with lower effectiveness and higher effectiveness teachers tending to show stable rank ordering over time—is not unique to Atteberry's study. Xu and colleagues (Xu et al., 2015) measured teacher performance trajectories in high- and low-poverty school settings in mathematics. Teacher effectiveness levels improved the fastest at the beginning of teachers' careers (i.e., 0–5 years), plateaued at 6–10 years, and resumed growing at 10–15 years of experience. The authors found that the fastest growing teachers improved significantly faster annually than slower growing teachers; that is, the students of novice teachers with initial low effectiveness showed annual lower achievement growth than students in the classes of higher effectiveness teachers. Teachers who were initially in the top effectiveness quartile tended to show a faster rate of improvement than teachers in the lower performing quartile; in fact, as much as 80% faster growth rate than their slower improving peers. About half of the total variation in teachers' performance was found within teachers, with about one-quarter to one-third explained by increasing experience, and the remainder by classroom and school level characteristics.

Trajectories of motivation profiles. It is not only teachers' effects on student achievement that shows stability, but teachers' motivation patterns also show stability over time. Watt and Richardson measured the motivation of pre-service teachers during their teacher training programs in Australia (Watt & Richardson, 2008). Using cluster analysis, the researchers found a sizable proportion of participants with low motivation, so-called 'lower engaged desisters,' who showed little change in motivation profiles over the course of the teacher training program. This low motivation group of pre-service teachers were disaffected with teaching as a career from the beginning of their training. A follow up study in the United States (Watt et al., 2014) that traced the motivation profiles over the course of teacher training resulted in similar findings. The authors concluded that the findings of a stable profile of low motivation pre-service teachers indicate a need to closely examine the process for the recruitment of teacher training candidates. The implications for selection are clear: *who* you select into teacher education matters, and selection decisions have long-term effects on teaching outcomes.

2.4 Teacher Effectiveness and Related Outcomes

Teachers influence students' academic achievement and social development, but they also influence factors related to learning outcomes, such as motivation and emotions. Much of the research on longer-term outcomes of teacher effectiveness comes from studies of large-scale databases by educational economists, rather than educational psychologists, who have suggested that teachers can affect more distal outcomes, like salary in adulthood.

Achievement outcomes. The contribution of teacher effectiveness to students' academic achievement is well documented. Teacher effectiveness is multi-faceted, and some effectiveness factors are stronger predictors of achievement outcomes than others. For example, Rockoff and colleagues (Rockoff et al., 2011) found that measuring a broad range of teacher characteristics, including cognitive and non-cognitive variables, noticeably increased the accuracy of the prediction of student achievement outcomes. Teachers have a systematic and measurable effect on students' achievement outcomes, at least when the outcomes are measured with standardized tests (Jackson et al., 2014). Test scores are the most frequently used measure of student outcomes. However, other student outcomes may also be important to understand the consequences of teacher effectiveness, including career aspirations, motivation profiles, and long-term financial outlooks.

Student motivation and emotions outcomes. We know that teacher effectiveness is associated with improved student learning, but the process through which teachers influence student outcomes is worth exploring. Although teachers' classroom practices (e.g., instructional strategies) represent one pathway influencing student learning, another pathway is through transmission of motivation and emotions. In this way, students' motivation and emotions are influenced by teachers' motivation and emotions. Teachers influence student motivation by encouraging students' persistence, effort, and resilience when obstacles are encountered or when success is elusive (Anderman & Midgley, 1997). In Zee & Koomen's, 2016 heuristic model, teacher motivation (especially self-efficacy) is linked to the quality of classroom processes such as instructional support, classroom organization, and emotional support. These classroom processes, in turn, influence not only students' academic achievement but also their motivation, which in turn reciprocally influences teachers' engagement and motivation (Zee & Koomen, 2016).

Emotions, too, serve an important role in learning. Positive emotions, such as enthusiasm experienced during learning can spur on continued effort and lead to a satisfying learning experience. Negative emotions such as anger or anxiety can hinder progress and may result in lowered effort and achievement. Teachers' emotions are transmitted to students: a two-phase study by Frenzel and her colleagues conducted in Germany showed that teachers' enjoyment of mathematics was transmitted to students, and that the effect was mediated by the level of teacher enthusiasm (Frenzel et al., 2009). A three-wave longitudinal model confirmed the positive reciprocal links between teachers' and students' enjoyment, mediated by perceptions of each other's classroom behaviors (Frenzel et al., 2018). The impact of effective teachers on student

Table 2.3 Estimates of financial impact of variation in teacher effectiveness

Study	Financial impact
Kane and Staiger (2002)	A one SD increase in teacher effectiveness represents a lifetime earnings gain of around $330,000 to $760,000 for a class of 20 students
Hanushek and Rivkin (2012)	A teacher in the top 15% with a class of 20 yields at least $240,000 in class-level economic gain compared with an average teacher
Chetty et al. (2014)	Teacher impacts for the bottom 5% of teachers are greater than $250,000 lifetime earnings per class
Hanushek and Woessmann (2011)	Replacing the least effective 5%–8% of teachers with average teachers would bring student achievement up by 0.4 SDs, resulting in $70 trillion added GDP to US economy

motivation and emotion outcomes can be considered just as important as learning outcomes, because enhanced motivation and positive emotions can have a lasting effect on student learning.

Financial outcomes. Effective teachers play an important role in influencing financial outcomes for students (see Table 2.3 for summary of financial impact of variation in teacher effectiveness). Research by economists Hanushek and Rivkin (2012) shows that replacing low performing teachers with average teachers would raise U.S. educational achievement to that of Canada and Finland. In financial terms, replacing a less effective teacher with an average teacher increases students' lifetime income by approximately $250,000 per classroom (Chetty et al., 2014). Students taught by more effective teachers are more likely to complete high school, attend college (and attend higher-ranked colleges), and enjoy higher future salaries (Chetty et al., 2014).

Another cost associated with teacher effectiveness is attrition. Teachers who leave the profession prematurely cost school systems up to $20,000 (Carver-Thomas & Darling-Hammond, 2017). Research has shown that teachers' individual attributes are linked to professional commitment and quitting intention (Klassen & Chiu, 2011). Making bad selection decisions is costly for students, school systems, and society as a whole. Improving teacher effectiveness at the systems level is a relatively low-cost approach to improving education systems and boosting economic outcomes for students and for society as a whole.

2.5 Are Effective Teachers Born or Made?

Teacher effectiveness influences multiple outcomes, but is it something that is innate in prospective teachers? In education, the debate about individual differences in teacher effectiveness has been hotly contested. On the one side of the debate, some researchers endorse the 'qualification hypothesis,' whereby teacher education and

professional development represent the most (or only) important source of influence on teaching effectiveness (see Kunter et al., 2013). In this view, the individual attributes of applicants are not too important, because high quality teacher education can 'fill in the gaps' in prospective teachers. On the other side of the argument, the 'good teacher,' 'born teacher,' or 'individual aptitude' hypothesis puts forward the notion that variations in success in teaching are due to specific and stable within-person attributes that teachers and prospective teachers bring into the classroom (Kennedy et al., 2008). These personal attributes vary among individuals, thus the identification of individuals with a particular set of characteristics is important when selecting for training and employment.

There has been strong resistance to the 'born teacher' hypothesis in the popular media and by some teacher educators. For example, a Seattle Times op-ed in 2012 opened with the claim "Some people think that good teachers are born; educators know that good teachers are made. They are made over time, through education, perseverance, practice, and guidance" (Knapp, 2012). Influential educational researcher Darling-Hammond (2006) labelled the born teacher hypothesis a 'damaging myth' and a 'superstition' that resulted in policies that relied on 'some kind of prenatal alchemy' (p. ix) to identify and prepare effective teachers. Opponents to the born teacher position hold that linking stable individual attributes with teacher effectiveness weakens the importance of the role played by training and development, and suggests that teacher educators, prospective teachers, and practicing teachers can do little to improve their effectiveness beyond the constraints provided by their personal make-up.

Theory and research on the 'born teacher' debate. A number of key theories have provided a framework for the born-or-made debate. Dispositional explanations of teacher effectiveness align with an entity perspective in Dweck's (2000) entity vs. incremental model of human abilities (see Fig. 2.2). In this model, important individual attributes that influence behavior are viewed as either (a) innate and unchangeable (*entity* view), or (b) malleable and influenced by training and experience (*incremental* view). Rather than providing an explanatory model of how human behavior is either innate or learned, Dweck's model addresses the consequences for learning of adopting one of the two stances, primarily for student learning: students who believe that their own abilities are malleable, rather than fixed, tend to display higher levels of perseverance and effort. Although primarily focused on students, the incremental-entity heuristic can also be adapted to understand opposing views of the development of teacher effectiveness.

Relevant to the born-or-made debate, some individual attributes, including personality traits and attitudes, seem to be relatively stable over time, and are stable and robust predictors of occupational outcomes (e.g., Spengler et al., 2015). The long-term predictiveness of personality and other individual attributes has been explained by life course models (e.g., Shanahan et al., 2014), which show how factors such as conscientiousness are long-term and stable predictors of outcomes through the life course. The relevance to teacher selection is clear: some measurable attributes seem to be stable and significantly related to important occupational outcomes. However, the powerful impact of effective teacher training and professional development cannot

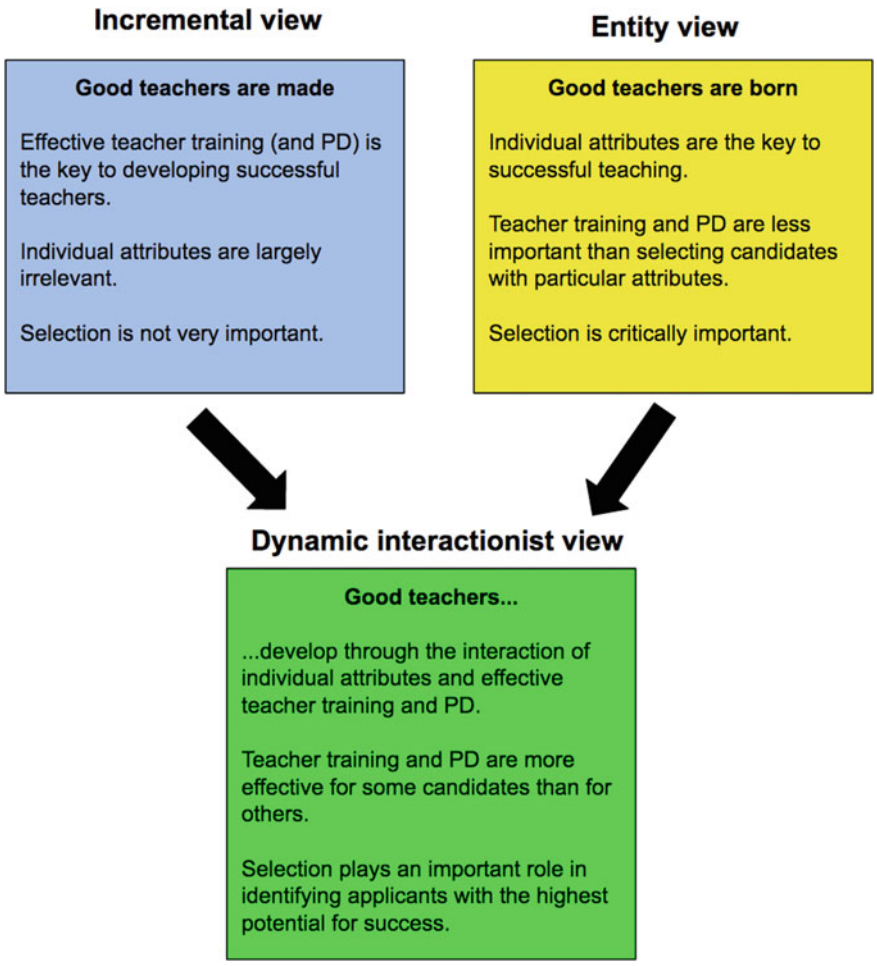

Fig. 2.2 Teacher selection and the 'Are teachers born or made?' debate (adapted from Klassen & Kim, 2017)

be denied: we know that teachers develop and improve over time. Our view of the born-or-made debate reflects a dynamic interactionist view in which good teachers develop through the interaction of individual attributes and high-quality professional training and development opportunities.

The born-or-made debate and teacher selection. The born-or-made debate has clear implications for teacher selection. Figure 2.2 highlights the relevance of selection from three viewpoints: the incremental view, the entity view, and a dynamic interactionist view. For those with an incremental view, selection is not very important, since key attributes and skills can be developed through effective teacher training and professional development. Many people involved in teacher education hold the view

that appropriate learning opportunities are the key to the development of effective teachers, i.e., an incremental view. However, for those with an entity view, selection is *everything*, because individual attributes are resistant to change, even with effective training. In the entity view, teacher training and PD are less important than choosing teachers with 'the right stuff.' Our interactionist view of teacher effectiveness is influenced by the arguments from the incremental view of human abilities whereby training and professional development improves teacher effectiveness, but also by an entity view where individual attributes—sometimes resistant to change—play an important role in influencing positive outcomes.

2.6 Chapter Summary

The purpose of this chapter was to consider how understanding teacher effectiveness is core to understanding teacher selection. We defined teacher effectiveness and examined how individual attributes relate to effective teaching. Teacher effectiveness makes an important difference for student outcomes, including academic, motivation, and even future financial outcomes. We also considered the 'born-or-made' debate, with consideration of incremental and entity views of teacher effectiveness, before settling on a dynamic interactionist view. In the next chapter we delve into research that explores how individual characteristics are related to teacher effectiveness, setting the stage for the consideration of what ITE program directors, school principals, and education authorities might look for in their quest for selecting the best possible prospective teachers.

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