

From Generation Z to Generation Alpha: A Comparison of Personality Types and Learning Styles in Elementary Students

Kilhong Joo¹, Changyeop Shin²

¹Department of Computer Education, Gyeongin National University of Education, Republic of Korea. ORCID ID: 1623-1629-1623-1629, khjoo@ginue.ac.kr

²Major in AI Convergence Education, Gyeongin National University of Education, Republic of Korea. tskckdduq102@gmail.com

Corresponding Author: Changyeop Shin, tskckdduq102@gmail.com

HOW TO CITE:

Kilhong Joo, Changyeop Shin
(2026). From Generation Z to
Generation Alpha: A Comparison
of Personality Types and Learning
Styles in Elementary Students.
International Journal of Special
Education, 41(22s), 1623-1629

COPYRIGHT STATEMENT:

Copyright: © 2026 Authors.
Open access publication under the
terms and conditions
of the Creative Commons Attribution
(CC BY)
license (<http://creativecommons.org/licenses/by/4.0/>).

ABSTRACT:

Do Generation Alpha learners differ from Generation Z? This study compared the two generations at the same developmental stage, assessing upper-elementary students in South Korea 20 years apart—Generation Z in 2006 (N = 195) and Generation Alpha in 2026 (N = 267)—with identical instruments: the Murphy–Meisgeier Type Indicator for Children (MMTIC) and the Grasha–Riechmann learning style scale. Three layers of change emerged. First, means shifted significantly on all four personality dimensions ($|d| = 0.28\text{--}0.49$): Generation Alpha moved toward Introversion, Thinking, and Judging, and the dominant pole on Sensing–Intuition reversed from Intuition to Sensing; collaborative learning preference also increased, and two new personality–learning style correlations emerged. Second, variance expanded significantly on all four dimensions (variance ratios = 1.62–2.18). Third, a learner model calibrated on Generation Z (2006) data misclassified Generation Alpha (2026) learners more often on every dimension, reaching a majority (58.4%) on Sensing–Intuition. Findings show that learner characteristics—both means and dispersion—cannot be assumed stable across generations and call for periodically recalibrated, probabilistic, teacher-in-the-loop measurement, particularly in special and inclusive education, where decisions depend directly on individual-difference information.

Keywords: Generation Alpha, cross-generational comparison, personality type, learning style, learner model.

1. Introduction

The proliferation of generative artificial intelligence (AI) is driving multifaceted changes across education, including personalized learning, intelligent tutoring, automated assessment, and the reconfiguration of teacher–student collaboration (Kamalov et al., 2023). Although Generation Alpha—the cohort now populating elementary classrooms—has attracted growing scholarly attention, existing discussions have largely been based on qualitative observation or

impressionistic description (Apaydin & Kaya, 2020), and empirical studies that directly compare this generation with a preceding generation at the same developmental stage using identical measurement instruments remain scarce. The present study aims to fill this gap.

How Generation Alpha differs from Generation Z in personality type and learning style carries practical implications at a time when AI-based personalized learning diagnostic tools are rapidly spreading. If learner models rely on norms and

cutoffs calibrated on data from past generations, generational shifts in the distribution of learner characteristics may lead such models to systematically misrepresent current learners. This problem is particularly consequential in special and inclusive education, where individualization tailored to each learner's educational needs is the starting point of practice, because special education decision-making, including the Individualized Education Program (IEP), depends directly on the accuracy of individual-difference information.

Accordingly, by comparing Generation Z and Generation Alpha at the same developmental stage (upper elementary grades) across a 20-year interval using identical measurement instruments, this study (a) tests whether the distributions of personality type and learning style have changed across generations, (b) tests whether the correlational structure between the two constructs has changed, and (c) quantifies the magnitude of misrepresentation that arises when a learner model calibrated on Generation Z (2006) data is applied to Generation Alpha (2026) learners.

2. Related Work

2.1 Generation Z and Generation Alpha

Generation Z, typically defined as those born between the mid-1990s and 2009, grew up alongside the diffusion of the internet, social media, and mobile devices and is accordingly described as the first generation of digital natives (McCrindle & Fell, 2020).

Generation Alpha (born 2010–2024) is characterized as the first generation to perceive digital and AI technologies as an essential medium of everyday life (Höfrová et al., 2024; McCrindle & Fell, 2020). A qualitative study by Apaydin and Kaya (2020) reported that, compared with Generation Z, Generation Alpha is more curious, impulsive, and self-centered, and more dependent on technology, while being more limited in social communication skills. Whether such qualitatively described differences manifest as measurable changes in personality

type and learning style is the empirical question addressed in the present study.

2.2 MBTI and MMTIC

The Myers–Briggs Type Indicator (MBTI) combines four dichotomous scales—Extraversion–Introversion, Sensing–Intuition, Thinking–Feeling, and Judging–Perceiving—to classify individuals into 16 types, rather than measuring traits on continuous scales (Stein & Swan, 2019). Beyond its diffusion in popular and commercial domains, the MBTI has received sustained scholarly attention, with as many as 193 studies employing the MBTI Form M between 1999 and 2024 (Erford et al., 2025), and its accessible 16-type language has served as a practical strength in educational and counseling settings (Stein & Swan, 2019). The Murphy–Meisgeier Type Indicator for Children (MMTIC) is the children's version of the MBTI, assessing the same four dichotomies with age-appropriate items. The present study adopted the MMTIC because the 2006 baseline study employed it (Ha, 2006), and analyzed its scores as continuous indices rather than dichotomous types.

3. Research Design and Analysis

This study employed a cross-sectional cohort design comparing the same school-age group at two time points. Because generational effects, period effects, and sampling differences are confounded in the observed differences and cannot in principle be separated, this study documents the existence of change without attributing it to any specific factor (e.g., AI exposure).

The Generation Z (2006) sample consisted of 195 sixth-grade students (112 boys, 83 girls) from an elementary school in Changwon, Gyeongsangnam-do, South Korea; the data were drawn from the group-level summary statistics reported in the original study (Ha, 2006). The Generation Alpha (2026) sample comprised individual-level raw data from 267 elementary school students (130 boys, 137 girls) in Seongnam, Gyeonggi-do (89 fifth graders and 45 sixth graders) and Hongseong, Chungcheongnam-do (133 sixth graders).

Regarding generational classification, the 2026 cohort (born around 2014–2015) clearly falls within the definition of Generation Alpha (born 2010–2024; McCrindle & Fell, 2020). The 2006 cohort (born around 1994–1995) lies at the early boundary of, or just before, Generation Z, given that definitions of its starting point vary across the literature from the mid-1990s to 1997. In this study, this cohort is therefore operationally defined as the “2006 cohort (Generation Z boundary group)” and referred to as Generation Z for convenience.

The Generation Alpha (2026) cohort was administered the same instruments used in the original 2006 study (Ha, 2006): the MMTIC and the Grasha–Riechmann learning style scale. Personality was measured on four bipolar dimensions—Extraversion–Introversion (E–I), Sensing–Intuition (S–N), Thinking–Feeling (T–F), and Judging–Perceiving (J–P)—as continuous indices ranging from 1 to 2 (midpoint 1.5; higher scores indicate a preference for I/N/F/P). Learning style was measured for three types—-independent, collaborative, and participant—on an 8-point scale (higher scores indicate stronger preference).

Mean differences between the two cohorts were tested with Welch’s independent-samples *t* tests (two-tailed; *t* computed as Generation Alpha (2026) – Generation Z (2006)). This test asks whether the average scores of the two groups are too far apart to be explained by chance alone: the *t* value expresses how large the gap between the two averages is relative to the variability in the data, and *df* (degrees of freedom) reflects the amount of information available for the test, which depends on the sample sizes. The *p* value indicates how likely a gap of this size would be if the two generations did not actually differ, and a result was considered statistically significant when *p* was below .05 ($\alpha = .05$). Effect sizes were calculated as Cohen’s *d*, which states the size of the gap in standard-deviation units; values around 0.2, 0.5, and 0.8 are commonly interpreted as small, medium, and large differences, respectively. Changes in the correlations between the two constructs were examined with Fisher’s

r-to-*z* transformation followed by *Z* tests, which ask whether a correlation observed in Generation Alpha (2026) is reliably stronger or weaker than the corresponding correlation in Generation Z (2006) ($|Z| > 1.96$ corresponding to $p < .05$). In the alignment analysis, the side of the scale midpoint (1.5) on which the Generation Z (2006) mean fell was taken as the model’s default classification for each dimension—that is, the Generation Z (2006) dominant pole—and the misfit rate was computed as the percentage of Generation Alpha (2026) learners whose scores fell on the opposite side of 1.5, in other words, the share of current learners whom the old default would classify incorrectly (scores of exactly 1.5 were excluded). Because individual-level data for Generation Z (2006) were unavailable, the Generation Z (2006) misfit rates are estimates obtained by assuming a normal distribution and using the reported means and standard deviations; this index is a descriptive, illustrative measure rather than a validated machine-learning evaluation.

Generational differences in variance—that is, in how widely scores were spread around the average—were assessed with variance-ratio (*F*) tests based on the standard deviations and sample sizes of the two cohorts, where the *F* statistic is the variance of one cohort divided by that of the other and values farther from 1 indicate larger differences in individual variability. It should be noted that, owing to the absence of raw Generation Z (2006) data, this is an approximate test that relies on the assumption of normally distributed scores.

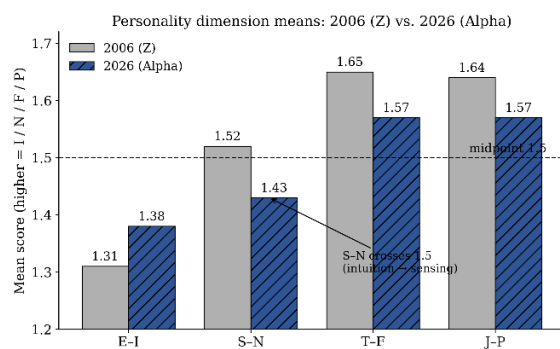
4. Results and Discussion

4.1 Differences Between Generation Z and Generation Alpha in Personality Type and Learning Style

Statistically significant generational differences emerged on all four personality dimensions (Welch’s *t* tests). E–I rose from 1.31 to 1.378, shifting toward Introversion ($t = 3.12$, $df \approx 460$, $p = .002$, $d = 0.281$), whereas S–N decreased from 1.52 to 1.430 ($t = -5.40$, $p < .001$, $d = -0.485$), T–F from 1.65 to 1.574 ($t = -3.97$, $p <$

.001, $d = -0.360$), and J–P from 1.64 to 1.573 ($t = -3.86$, $p < .001$, $d = -0.343$). All effect sizes were “small” by Cohen’s criteria ($|d| = 0.28–0.49$). The four shifts, however, do not carry the same meaning. On E–I, T–F, and J–P, the dominance of Extraversion, Feeling, and Perceiving, respectively, was retained at both time points with only a weakening in strength, whereas S–N was the only dimension on which the mean crossed the scale midpoint of 1.5, reversing the dominant pole itself from Intuition to Sensing, and it also showed the largest effect size ($d = -0.485$; Figure 1).

Figure 1. Personality Dimension Means: 2006 (Z) Versus 2026 (Alpha)



Note. The S–N dimension crossed the 1.5 midpoint, reversing the dominant pole from Intuition to Sensing.

Plausible background factors for the respective shifts may include increased digital-device use and time spent alone (E–I), an environment requiring instantaneous processing of concrete digital information (S–N), early exposure to AI and information technologies (T–F), and expanded structured time-management demands such as private tutoring (J–P); all of these interpretations are, however, post hoc conjectures.

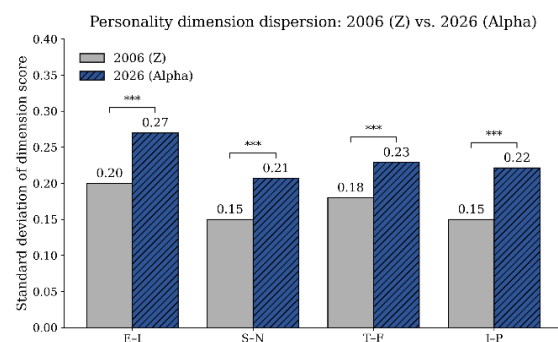
Among the three learning styles, only the collaborative style increased significantly ($5.17 \rightarrow 5.443$, $t = 3.72$, $p < .001$, $d = 0.340$); changes in the independent ($4.91 \rightarrow 4.855$, $p = .402$) and participant ($5.99 \rightarrow 6.102$, $p = .209$) styles were nonsignificant. In the personality–learning style correlational structure, two of the 12 correlation pairs changed significantly (Fisher r -to- z): the Thinking–Feeling $\times$ participant correlation

increased from .068 to .269 ($Z = 2.19$, $p = .029$) and the Judging–Perceiving $\times$ collaborative correlation from .067 to .309 ($Z = 2.66$, $p = .008$), such that new positive correlations emerged in pairs that had been essentially uncorrelated in 2006. This suggests that, beyond mean-level shifts, the relational structure between the two constructs is itself not fixed across generations. From the perspective of learner models, this point is important: if rules for inferring learning style from personality information are fixed on the basis of the correlational structure at a single time point, those rules themselves may be invalidated over time.

4.2 Widening of the Trait Distribution: Increased Individual Differences Beyond the Mean

Generational differences were not confined to shifts in means. On all four personality dimensions, the standard deviation of the Generation Alpha (2026) cohort was larger than that of Generation Z (2006): E–I increased from 0.20 to 0.270, S–N from 0.15 to 0.207, T–F from 0.18 to 0.229, and J–P from 0.15 to 0.222. Variance-ratio tests showed that this difference was significant on all four dimensions ($F(266, 194) = 1.62–2.18$, all $p < .001$; Figure 2). The expansion was largest on J–P (variance ratio = 2.18).

Figure 2. Personality Dimension Dispersion: 2006 (Z) Versus 2026 (Alpha)



Note. Bars show the SD of each dimension by cohort. *** $p < .001$.

As a background for this distributional widening, the increasing heterogeneity of the digital and educational environments experienced by

Generation Alpha may be hypothetically proposed. Nevertheless, because two groups separated by a 20-year interval were compared with the same yardstick, factors other than genuine individual differences may have contributed to this increase in variance.

The widening of the distribution carries two implications. First, the increased internal heterogeneity of Generation Alpha means that the representation of an “average Generation Alpha learner” is, if anything, less representative of individual learners than it was for Generation Z: not only has the mean shifted, but cohesion around the mean has itself weakened. Second, this expansion combines with the mean shifts to amplify classification misfit, as quantified in Section 4.3.

4.3 Degradation of Learner-Model Fit

To evaluate the practical consequences of the mean shifts (Section 4.1) and variance expansion (Section 4.2) at the level of individual learners, a learner model calibrated on Generation Z (2006) data—a model that assumes the 2006 dominant pole on each dimension as the default for all learners—was applied to the 267 Generation Alpha (2026) learners using the misfit-rate definition given in Section 3. The analysis showed that the misfit rate increased on all four dimensions (Table 1).

Table 1. Misfit Rate Under the 2006 (Z) Learner Model Applied to the 2026 (Alpha) Cohort

	E-I	S-N	T-F	J-P
2006 pole	E	N	F	P
Misfit % (2026)	29.2	58.4	31.8	31.8
Est. % (2006)	17.1	44.7	20.2	17.5
Δ (pp)	+12.1	+13.7	+11.6	+14.3

Note. The misfit rate is the percentage of students whose score fell opposite the 2006 (Z) dominant pole—observed for 2026 (Alpha; $N = 267$) and estimated for 2006 (Z) by normal approximation from the reported means and SDs. Δ is their difference in percentage points.

The increases in misfit ranged from 11.6 percentage points (T-F) to 14.3 percentage points (J-P); on the S-N dimension in particular,

the Generation Z (2006) default (Intuition) misclassified a majority of Generation Alpha (2026) learners (58.4%; 156 of 267). It is noteworthy that individual-level misfit was this substantial even though all mean effect sizes were “small” ($|d| \leq 0.49$). This is interpreted as the combined product of the two preceding sections’ findings. In the case of S-N, the 2006 mean (1.52) was already close to the midpoint, so the estimated misfit rate had already reached 44.7%; to this were added a mean shift that crossed the boundary ($1.52 \rightarrow 1.430$) and an expansion of variance ($SD\ 0.15 \rightarrow 0.207$), driving misfit past the majority mark. This case illustrates a structural limitation of MBTI/MMTIC-style dichotomous classification, which reduces individuals near the boundary to a single dominant pole.

4.4 Implications for Measurement Design

Taken together, the mean shifts, variance expansion, and resulting model misfit—along with the partial reorganization of the personality-learning style correlational structure—indicate that norms, cutoffs, and construct-linking rules calibrated at a single time point cannot be assumed stable over time.

These findings impose the following requirements on the design of new personality measurement instruments for Generation Alpha. First, norms and cutoffs should be treated not as permanent assets but as objects of periodic revalidation and updating, and changes in the entire distribution—including variance as well as the mean—should be continuously monitored. Second, because small mean shifts can produce large classification discrepancies and distributional widening amplifies them, continuous and probabilistic representations with uncertainty indicators near decision boundaries are needed in place of fixed dichotomous types. Third, because young learners may interpret the same items differently across generations, reliance on self-report alone should be avoided (Soto et al., 2008; Vicentini et al., 2025). Multiple sources of information, such as behavioral observation and interactions during learning, should be used together for cross-validation, and

learners should be understood through profiles that vary with the situation rather than through fixed types applied identically in every context (Fleeson, 2001; Mischel & Shoda, 1995).

Even with these measures, however, models remain vulnerable to misfit and drift. The outputs of learner models should therefore be positioned as reference materials that assist teachers' decision-making, not as devices that automatically classify and place students. In particular, because designs that match instruction to learning styles lack empirical support (Pashler et al., 2008), learning style information is best used not as a prescriptive tool but as reference material aiding teachers' interpretation.

5. Conclusion and Suggestions

Comparing the same school-age group (upper elementary grades) across Generation Z in 2006 (N = 195) and Generation Alpha in 2026 (N = 267) revealed three layers of change: a shift in means, an expansion of variance, and a reorganization of the relational structure. This demonstrates that the learner representation of 20 years ago can no longer capture today's learners, and that personality and learning style measurement for Generation Alpha needs to be rebuilt on new design principles.

Several limitations should be noted. The cross-sectional cohort design confounds generational, period, and sampling effects, so the observed

changes cannot be attributed to any single factor such as AI exposure, and measurement invariance was not formally tested. Further limitations include the reliance of the Generation Z (2006) misfit rates and the variance comparison on reported summary statistics rather than raw data, and the psychometric constraints of MBTI-style dichotomous dimensions and the Grasha–Riechmann scale. The samples' differing sex composition (57.4% vs. 48.7% boys) runs in the direction of offsetting, rather than producing, the decrease on the T–F dimension.

Accordingly, personality and learning style measurement for Generation Alpha in the AI era should be oriented toward era-sensitive periodic recalibration, continuous and probabilistic representation, multiple inputs, context-sensitive profiles, and teacher-in-the-loop decision support. Such recalibration and prudent use are especially valuable in special and inclusive education settings, where educational decisions—as in the Individualized Education Program (IEP)—depend directly on individual-difference information. Remaining tasks for future research include testing measurement invariance with item-level data, developing and validating generation- and age-appropriate measurement approaches, and separating generational and period effects through multi-wave, multi-region, balanced samples.

References

- Apaydin, Ç., & Kaya, F. (2020). An analysis of the preschool teachers' views on Alpha generation. *European Journal of Education Studies*, 6(11), 123–140. <https://doi.org/10.5281/zenodo.3627158>
- Erford, B. T., Zhang, X., Sweeting, E. L., Russo, M., Rashid, A., Sherman, M. F., Bradford, E. L., Wang, X., Gao, A., Huang, X., Liu, Z., Haskew, A., MacImerney, E. K., Moore, E., Thompson, D., Barboza, S., Huang, X., Zhou, A., Xu, Y., . . . Yang, X. (2025). A 25-year review and psychometric synthesis of the Myers–Briggs Type Indicator (MBTI) – Form M. *Journal of Counseling & Development*, 103(4), 403–417. <https://doi.org/10.1002/jcad.70006>
- Fleeson, W. (2001). Toward a structure- and process-integrated view of personality: Traits as density distributions of states. *Journal of Personality and Social Psychology*, 80(6), 1011–1027. <https://doi.org/10.1037/1623-1629.80.6.1011>
- Ha, Y.-H. (2006). The relationships among personality type, learning style, and multiple intelligences in elementary school students [Unpublished master's thesis]. Kyungnam University.
- Höfrová, A., Balidemaj, V., & Small, M. A. (2024). A systematic literature review of education for Generation Alpha. *Discover Education*, 3(1), Article 125. <https://doi.org/10.1007/s41623-1629-01623-1629>

-
- Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New era of artificial intelligence in education: Towards a sustainable multifaceted revolution. *Sustainability*, 15(16), Article 12451. <https://doi.org/10.3390/su151612451>
- McCrindle, M., & Fell, A. (2020). *Understanding Generation Alpha*. McCrindle Research.
- Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review*, 102(2), 246–268. <https://doi.org/10.1037/1623-1629X.102.2.246>
- Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2008). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, 9(3), 105–119. <https://doi.org/10.1111/j.1623-1629.2009.01038.x>
- Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2008). The developmental psychometrics of Big Five self-reports: Acquiescence, factor structure, coherence, and differentiation from ages 10 to 20. *Journal of Personality and Social Psychology*, 94(4), 718–737. <https://doi.org/10.1037/1623-1629.94.4.718>
- Stein, R., & Swan, A. B. (2019). Evaluating the validity of Myers-Briggs Type Indicator theory: A teaching tool and window into intuitive psychology. *Social and Personality Psychology Compass*, 13(2), Article e12434. <https://doi.org/10.1111/spc3.12434>
- Vicentini, G., Raccanello, D., & Burro, R. (2025). Self-report questionnaires to measure Big Five personality traits in children and adolescents: A systematic review. *Scandinavian Journal of Psychology*, 66(5), 627–653. <https://doi.org/10.1111/sjop.13110>
-