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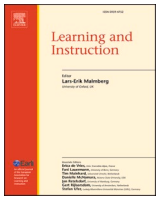

Straight from the teacher's mouth: The value of own-perspective gaze-elicited think-aloud for understanding culture-specific teacher expertise

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ABSTRACT

The pervasive influence of culture in human society is well-documented in experimental settings and in early years. However, less is known regarding cultural differences during classroom instruction, especially at the process-level: yet, classroom experiences are fundamentally cultural and dynamic in nature. Therefore, this paper examined patterns of teacher cognition across two country settings. To do this, forty teachers from two countries, UK (10 experts, 10 novices) and Hong Kong (10 experts, 10 novices), were eye-tracked during naturally-occurring teacher-centred classroom instruction. We then used participating teachers' own gaze replays elicited teachers' own commentaries on their cognition as occurred during the eye-tracked classroom instruction. These commentaries formed the data that we thematically analysed. We computed talk proportions from these and subjected them to multivariate Dirichlet regression analyses. We found cultural differences to emerge comprehensively across the teacher cognitions investigated—perceptions, thematic focus, timescales, holistic processing, classroom relationships. Culture interacted with expertise to predict teacher cognitions across four out of five overarching categories considered within this paper. Implications for teacher development are discussed, including the importance of sensitivity to the cultural context when considering teacher effectiveness.

Culture is not only the way we live, but also the way we learn. An innate preference for cultural sensitivity seems wired into us: we as humans seem born to pursue and prioritise communal norms over and above what would otherwise be the most efficient and logical route to outcome—a tendency observed very early on, from infancy (e.g., Király et al., 2013; Tomasello et al., 1993). It is inevitable, then, that culture should shape the way we teach. Correspondingly, innate instructional devices (i.e., inborn teaching techniques) seem to be wired into us as human adults as we employ natural pedagogy as soon as we assume parenthood by enacting innate systems of nonverbal communication playing a primary role in the passing on of cultural values[1] (Csibra & Gergely, 2009). Thus, human societies appear to be programmed for cultural transmission of communal expectations, both in what human adults see and in how they respond (e.g., Foulsham et al., 2010).

Although the above is well-documented in experimental settings and in early years, less is known from the real-world and later on in child development. With children spending as much time at school as at home after infancy, the influence of cultural values through social signalling (i.e., nonverbal communicative protocols) within the classroom becomes relevant (Pianta et al., 2012). A large body of research lends support to contrasting priorities when making East–West comparisons of cultural values, in societal values (e.g., Varnum et al., 2010) and in classroom instruction (e.g., Leung, 1995). But few systematic comparisons have been made on the expression of cultural values during the process of classroom instruction. With this in mind, numerous survey analyses have been reported (for a meta-analysis, see Dekker & Fischer, 2008), with inferences on cultural differences in pedagogy.

However, non-reactive and process-tracing methodologies are necessary to access teacher cognition in a way that richly reveals cultural values in action. To this end, we approached two teacher

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[1] Cultural values are societal scripts for collective cognition and behaviour. One of the most prevalent classification system for these is Hofstede's (2011) six-dimensional framework.

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groups—one from the UK (West) and one from Hong Kong (East)—and used naturalistic eye-tracking replays of classroom instruction as stimuli for teacher reports on their own cognition, an approach known as own-perspective gaze-cued think-aloud (McIntyre et al., 2022). We believe this approach has yielded unprecedented, non-reactive yet culturally-sensitive, insight into teachers' cultural values during classroom instruction.

1. Culture is a force of (human) nature

Culture is how we live. From an early age, we look for societal conventions to follow, in order to engage and be understood, prioritising communion over efficiency (Kiraly et al., 2013). The need to identify and conform with cultural frameworks seems hard-wired into being human. If culture is the way we live, how much more is culture the way we teach when, as adults, our 'nurture' has consolidated our 'nature' to pursue a culture-driven way of being: teachers enact and enforce all-important rules from culture which, more than ever before, they themselves recognise to, somehow, hold supreme importance for the collective (Gay, 2013). Academic and societal readiness has rightly grown for critical analysis of established cultures, the debate of cultural values, and selective acculturation, especially where inequalities are propagated (Swartz, 2012). Nevertheless, vast expanses of ancient wisdom remain untapped which deserve depth of understanding and transmission down the generations (Ryan & Louie, 2007), and that are entirely acceptable—even beneficial—frameworks for inter-generational support, nurture, and pedagogy (Huang & Asghar, 2018; Soto et al., 2011). The latter is what this paper seeks to investigate.

Cultural values vary between countries, resulting in country differences in how teachers teach. Comparative research has documented differences in instructional goals, with Western European instruction teaching learners how to learn, and East Asian instruction focused on learning how to do (Hofstede, 1986). In comparison with Western counterparts, East Asian teachers would teach the same subject area for a longer period of time (Perry, 2000) and use a wider range of tasks (Stevenson & Lee, 1995) to maximise depth of content knowledge among learners. Also, East Asian teachers employ individual seatwork and whole-class instruction more than Western counterparts, who use group work when possible (Leung, 1995). Correspondingly, East Asian teachers exceed Western counterparts in Subject and Pedagogical Content Knowledge, whereas Western teachers lead in General Pedagogical Knowledge (König et al., 2011). Thus, not only do teaching approaches differ between countries, but this also results in complementary expertise for classroom instruction.

2. What are cultural values in classroom instruction?

An overview can be provided of differences in cultural values in teacher cognition during classroom instruction. Three areas of cultural values are relevant: these are inter-dependence, long-term orientation, and the foreground of socio-emotion which have found the most long-standing and consistent support in eye-tracking research over the decades.

Inter-dependence refers to mutual reliance upon others and is well-documented as a core cultural value among East Asians (Varnum et al., 2010). Accordingly, a teacher's cultural context can drive their perceptions and responses during classroom instruction (Dalmaso et al., 2020) which would, in turn, shape their instructional goals and priorities (McIntyre et al., 2019). As a result of this inter-dependent social orientation, holistic perception and cognition is prevalent among East Asians has been associated with their holistic approach to identifying objects by naming single, whole objects from each image within a Rorschach Test (Abel & Hsu, 1949): this contrasts with Western counterparts who typically hold an independent social orientation and identify multiple objects within the same Rorschach images. Correspondingly, East Asian teachers—especially experts—have displayed holistic approaches to classroom attention through heightened instances of scanning gaze in comparison to Western counterparts (McIntyre & Foulsham, 2018).

Long-term orientation is the prioritisation of the future over the present: this tendency has been observed as being more prevalent among East Asians than in Western populations (Minkov & Hofstede, 2012). This relates to Confucian teachings of restraint and decisions made for the sustained and substantive benefit of the in-group over and above the individual (Chinese Culture Connection, 1987). Teachers in contexts with high long-term orientation benefit from a stronger ecosystem of support for continued educational development outside of the classroom. In other words, parents' choices for the child, for family life, and for themselves all contribute to the learners' learning gains (Figlio et al., 2019)—a pattern particularly observable in Mathematics learning (Hofstede & Minkov, 2010). Long-term orientation has also been associated with temporally unstructured classroom activities, where people and in-group cohesion take at least equal priority with time constraints, with time being fluid rather than fixed, and peripheral rather than central in focus (Nguyen et al., 2006). Equally, the long-term practical utility of educational experiences receives great emphasis among East Asians, with employment and career related prospects being a dominant motivator over and above experiences in the present (Guo, 2015), and the net reward for the in-group (or family) from the learner's classroom instruction takes priority over the learner's immediate enjoyment (Ho, 2020).

Socio-emotion is kept in the background and away from the foreground among East Asians, especially when compared with Western populations, in accordance with the contrasting importance given to self-expression between East and West (Markus & Kitayama, 1991). One artefact of this is how emotion is not primarily shown on the face among East Asians as it is among Westerners (Matsumoto, 1988; see also Ip et al., 2021). Another is the way East Asian emotional expression and perception are consistently less intense than those of Westerners (Matsumoto & Ekman, 1989). Related is the way relationships—or relational dynamics—are kept in the background in East Asia, in accordance with the culture's indirect and other-centred communication code (Yum, 1988). In the classroom, the inter-dependent social orientation of East Asians would result in emotional modulation and restraint as a hidden socio-emotional curriculum, in contrast to a full expression of learners' emotional experiences as the socio-emotional curriculum among Western Europeans (Savina & Wan, 2017)—a cultural value and goal that would be reinforced at home (Yang & Wang, 2019).

3. Measuring culture in education

Few methods have been designed to tap into cultural values in action—especially in relation to classroom instruction. Surveys have dominated the international comparative research landscape, with Hofstede's cultural dimensions (Hofstede, 1986) being widely used across the disciplines, including in Education. Alongside this, major cultural comparison surveys include the Schwartz Value Survey (Fischer et al., 2010), Rokeach's Value Survey (Hofstede & Bond, 1984), the Global Leadership and Organisational Behaviour Effectiveness (GLOBE; House, 2004), and Inglehart's World Values Survey (Inglehart et al., 2000, 2006). Meanwhile, those mindful of contextual sensitivity would advocate and employ interviews with consideration for the inter-cultural complexities within the design of the interview protocol (Knight & Saunders, 1999; Suh et al., 2009), with particular emphasis on the anthropological approach to educational research (La Belle, 1972).

Yet, surveys which cannot access processes within the moment itself, and individual interviews which cannot be scaled across countries for comparative analysis. Moreover, where methods have been employed and established, these have often been used in isolation from other methods or data streams which, among other issues, brings about an

insufficient consideration for context (Baskerville, 2003). What we need is a method to enable all the above: process-tracing whilst also allowing teachers to speak from out of their cultural paradigm, and with potential for cross-corroboration alongside other data streams as simultaneous sources of insight.

Cognitive interviews begin to address these concerns and access context-related processes in cr0ss-cultural (e.g., Miller et al., 2005) and educational (Jang & Protacio, 2020) research: these use survey items and verbal probes to invite explanations or inferences for participants' prior responses (Cibelli-Hibben & de Jong, 2020). While cognitive interviews are often partnered with think-aloud, we went one step further in the present study to employ media stimuli to elicit commentaries. Specifically, we used participants' own eye gaze recordings from naturally-occurring classroom instruction to elicit their think-aloud commentary, a technique also known as own-perspective gaze-cued think-aloud (McIntyre et al., 2022).

Beyond this, the expert–novice design provides further insight into cultural processes in the classroom. In fact, we view expert-specific teaching to epitomise culturally-relevant teaching. Expertise is contextually bound (Chi et al., 2014) and teaching forms a skill-related—rather than academic—expertise. Teacher expertise relies on tacit and context-specific knowledge (Cianciolo et al., 2006, pp. 613–632) and is specific to context, place, and time (Cianciolo & Sternberg, 2018). If expert teachers can be identified in a contextually sensitive way (e.g., McIntyre et al., 2017), then optimally culture-specific teaching is within reach. Accordingly, we used Palmer et al. (2005) which takes multiple context-specific considerations into account when identifying expert teachers: namely, social nomination, within-school judgements of the teacher's professional performance, and local awards and qualifications. This way, we opted against the absolute, de-contextualised, and universal view of expertise—with experts held as qualitatively distinct from novices—to examine teacher expertise from a relative, context-driven, and perspective (Chi, 2006), using an expert–novice design. Thus, we sought to uncover the most culturally-relevant teaching from what expert teachers did and that novice teachers did not do.

4. The present study

Culture informs the very essence of human experience, including classroom instruction (e.g., Király et al., 2013; Tomasello et al., 1993). The fundamental role of culture means that teachers' experiences can be expected to differ between countries, including teacher cognition. To date, these revolve around holistic cognition, long-term orientation, and socio-emotional foreground. Since professional expertise can be expected to embody the fluent assimilation of the contextual culture with pedagogical demands, an expert–novice teacher comparison would be a valuable research design to employ when investigating cultural values in the classroom. Moreover, we examine a non-reactive and culturally sensitive approach to process-tracing teacher cognition during classroom instruction by using gaze-cued own-perspective videos to elicit culturally bound teacher cognition. Accordingly, our research questions were as follows.

Research Question 1: Is there a cultural difference in teacher cognition, when elicited retrospectively by own-perspective gaze recordings?
Research Question 2: Are there expertise differences in teacher cognition, as revealed by own-perspective gaze-elicited think-aloud, and in accordance with prior research (McIntyre et al., 2022)?
Research Question 3: Is there an interaction between culture and expertise in teacher cognition, as elicited by own-perspective gaze-elicited think-aloud?

5. Methods

5.1. Participants and design

Expert teachers were identified and recruited alongside school leadership using contextually sensitive definitions via the Palmer et al. (2005) framework, a multi-faceted one with four criteria: (1) years of teaching experience, (2) teacher performance ratings, (3) social recognition of excellence (e.g., selection by senior leadership team as 'expert' for the present study), and (4) additional qualifications (e.g., extra school responsibilities, Masters-level qualifications). Novices, in turn, were those who least conformed to these criteria and, as far as possible, contrasted with the experts in these respects. That is, novices in this study were not necessarily newcomers to the teaching profession; rather, they were teachers in the same school as experts who contrasted most with the experts. Because experts scored statistically significantly higher than novices on all of these criteria when compared both across the whole sample (e.g., all experts vs. all novices) and within cultural groups (e.g., Hong Kong experts vs. Hong Kong novices) according to analyses of variance ($p = .01$ to $p < .001$), years' experience in teaching was not seen as the sole or primary criterion: rather it was only one of several equally important criteria for teacher expertise. These experts are compared with novice teachers in the school who are the lowest scoring on Palmer's dimensions for expertise, thus enabling an expert–novice comparative design.

Culture was defined geographically, where teachers working in each, Hong Kong and the UK, represented these regions. Twenty teachers participated from the UK (10 experts, 10 novices); twenty teachers participated from Hong Kong (10 experts, 10 novices). Secondary schools were involved, with full compliance of ethical standards in the UK and Hong Kong.

5.2. Apparatus

Teacher gaze was recorded using Tobii 1.0 eye-tracking glasses. Data rate was 30Hz, making one key frame one thirtieth of a second. The eye-tracker was calibrated to each participant using a nine-point calibration system. The glasses yielded a 640 x 480px video: 56° horizontally, 40° vertically. This eye-tracker made simultaneous recordings of the classroom scene and audio as well as the teacher gaze: this then constituted the gaze-cued own-perspective videos to be used during think-aloud.

The retrospective commentaries were recorded using a screen-recording software, Camtasia. Camtasia is installed separately and in addition to the eye-tracking analysis software, Tobii Studio 3.2.0. The gaze-cued own-perspective video was simultaneously presented using the eye-tracking software and recorded on-screen. The screen-recorder also recorded the interview audio, namely the audio from the gaze-cued own-perspective video and that from the interview itself.

5.3. Procedure

The procedure for collecting teachers' eye-tracking data is described in greater detail elsewhere (McIntyre et al., 2017). In brief, each participating teacher wore the eye-tracker during a lesson falling within the natural course of their curriculum. Because the overall project was focused on teacher cognition, teacher-centred provision formed the focus of our data collection: that is, where the teacher is lecturing, explaining, or presenting from the front of the classroom; teacher centred teaching is rich in content from teachers, and low in content from students. Therefore, the eye-tracking lasted for a total of 10 min' worth of teacher-centred learning. Once eye-tracking was completed, a think-aloud appointment was scheduled with the teacher as soon after eye-tracking as possible (i.e., on the same day).

The think-aloud appointment lasted 30 min. During the appointment, the functionalities of the screen-recording software were explained. Next, the participant was given a tour of the gaze-cued own-

perspective video-viewing interface (especially what and where the gaze cursor was) and the task of think-aloud commentary was explained to the participant. A short section of that participant's gaze-cued own-perspective video was presented to demonstrate how he or she might provide a think-aloud commentary in relation to that section. The participant then had a chance to practise the task before the 'real' commentary began. Throughout the session, participants had the option to pause the video when they wished to commentate, or to commentate over the video while it continued playing. If neither occurred, the first author would pause the video and invite think-aloud from the participant.

5.4. Measures and analyses

Qualitative data analysis. Qualitative analysis took place first of the own-perspective gaze-cued think-aloud data. For this, the coding scheme applied to the think-aloud data can be found in Supplementary Material 1. In brief, the coding scheme consisted of five categories of codes: Perceptions and Interpretations (Type 1), Themes & Focus (Type 2), Temporality (Type 3), Cumulative Cognitive Processing Codes (Type 4), and Relational Codes (Type 5). With one exception (Cumulative Cognitive Processing), all codes were applied to idea units in think-aloud transcripts: that is, sentence-like segments that express a clear thought or idea within each participant's think-aloud transcript.

Codes were analysed at three levels. First, coded data remained as they were when first coded: individual, unmerged codes. Next, codes underwent a mid-merge, which led each category to contain a smaller number of codes. Finally, codes underwent a full merge which collapsed all codes under the same theme. Within each over-arching category, we also identified thematic clusters of (unmerged) codes: these thematic clusters were to conduct mid-merges (see McIntyre et al., 2022, for full table of code merges with examples from raw data).

The UK think-aloud data was coded by a native English speaker for the McIntyre et al. (2022) publication; it was checked for reliability via another coder. The Hong Kong think-aloud data was coded by a native Cantonese (Hong Kong Chinese) speaker and co-author in the present study, using the same framework (Wolff et al., 2017). The framework was iteratively tested on subsamples of data to inspect for the possibilities of adaptation to the East Asian context. After verification for the Hong Kong context, the framework was then applied to the whole dataset, with reliability inspected via another coder and third author of this study. Both the UK and Hong Kong inter-coder reliability were inspected with a second coder classifying 10 % of the data: this arrived at $K_w = 0.75$ to 0.79, as measured by the weighted Kappa which reflects substantial agreement (Viera & Garrett, 2005). Note that the Weighted Kappa was used to take into account differing transcript lengths across participants (Cohen, 1968).

Quantitative data analysis. Quantitative data analysis took place next on the same think-aloud data. After the Hong Kong think-aloud data was coded, the two countries were compared using a similar approach to our McIntyre et al. (2022) publication to uncover cross-cultural similarities and differences in expert teacher cognition. As in the McIntyre et al. (2022) publication, the present data was transformed into proportions and analysed using an analytic technique appropriate to proportion data. We did this for two reasons: to address the differing sample sizes (i.e., variations of total utterances per participant) across the two datasets in the present analysis and to address the inability for count data to satisfy Gaussian assumptions.

We employed the Dirichlet regression which enables multivariate analysis of proportion dependent variables with interaction terms as predictors (Maier, 2014, 2021). For this study, the interaction term was Culture x Expertise. We ran three separate multivariate Dirichlet regressions with three different sets of dependent variables: the first predicting the fully merged codes (Model 1); the second predicting mid-merged codes (Model 2); the third predicting the unmerged codes (Model 3). Each subsequent model included as dependent variables only the subcodes (e.g., in Model 3) in which the overarching codes yielded significant Culture × Expertise interactions during the prior analysis (e.g., in Model 2). In addition to analytic outcomes for the interaction term, each model also yielded analytic outcomes for the main effects of Culture and Expertise. The full tables of regression outcomes from this sequence of analyses are included (Tables 1–3).

A quantitising approach to mixed methods research. By taking the approach described above, we employed the mixed methods work of 'quantitising' data that had hitherto been handled in a qualitative fashion (Nzabonimpa, 2018; Onwuegbuzie, 2025). In doing so, we showcase scalable analytic processes and readable analytic insights from data that originally emerged as rich but difficult to navigate, as multimodal real-world data often is. Thus, we are progressing the research life stage of our research programme in which we have been investigating the analytic potential of eye-tracking and verbal data, for contextually-sensitive knowledge regarding processes in classroom instruction, over an extended period of years (McIntyre et a., 2017; McIntyre & Foulsham, 2018; McIntyre et al., 2022). As we report our quantitised analytic approach and outcomes, we leverage and bring together the complementary advantages of the rigorous, thick description made possible by qualitative work alongside efficient, scalable synthesis made possible quantitative work, to take full advantage of the potential for process-related insights from our process-rich data sources and research design.

6. Results

This paper examined teacher cognition as revealed by own-perspective gaze-cued think-aloud. *Cultural* differences were stark (Research Question 1, henceforth RQ1). Whereas *expertise* differences in teacher cognition were not comprehensive (Research Question 2, henceforth RQ2), *Culture* × *Expertise* interactions were strong (Research Question 3, henceforth RQ3). Below, we organise our Results by reporting outcomes one research question at a time, focusing the narrative on the fully merged codes (Model 1). At times, we provide details from the mid-merge codes (Model 2) and the unmerged codes (Model 3)—but the full analytic outcomes are found in Tables 1–3 Every code is defined and exemplified in Supplementary Material 1.

Table 1
Dirichlet regression outcomes for fully merged codes.

		b	s.e.	z	p
Total_Perception	(Intercept)	4.0914	0.2262	18.085	<0.001
	Culture_HK	−1.2608	0.3299	−3.822	<0.001
	Expertise_Expert	1.0413	0.3188	3.266	0.001
	Culture_HK: Expertise_Expert	−1.6174	0.4695	−3.445	<0.001
Total_Themes	(Intercept)	4.023	0.2264	17.773	<0.001
	Culture_HK	−1.6991	0.3324	−5.111	<0.001
	Expertise_Expert	1.0109	0.319	3.169	0.002
	Culture_HK: Expertise_Expert	−1.2352	0.472	−2.617	0.009
Total_Timescale	(Intercept)	4.023	0.2264	17.773	<0.001
	Culture_HK	−3.5475	0.3548	−9.998	<0.001
	Expertise_Expert	1.0034	0.319	3.146	0.002
	Culture_HK: Expertise_Expert	−1.0654	0.5027	−2.119	0.03
Total_Global	(Intercept)	2.2642	0.235	9.636	<0.001
	Culture_HK	−2.0608	0.3654	−5.639	<0.001
	Expertise_Expert	0.5798	0.3289	1.763	0.08
	Culture_HK: Expertise_Expert	−0.8501	0.5189	−1.638	0.10
Total_Relations	(Intercept)	4.3537	0.2258	19.28	<0.001
	Culture_HK	−2.9507	0.3401	−8.677	<0.001
	Expertise_Expert	1.1635	0.3184	3.654	<0.001
	Culture_HK: Expertise_Expert	−1.6788	0.4866	−3.45	<0.001

Table 2
Dirichlet regression outcomes for mid-merge codes.

		b	s.e.	z	p
Type_1_Perception_Midmerge_Prop	(Intercept)	2.28	0.16	13.98	<0.001
	Culture_HK	−0.47	0.24	−1.92	0.05
	Expertise_Expert	−0.10	0.23	−0.43	0.67
	Culture_HK:Expertise_Expert	−0.69	0.36	−1.90	0.06
Type_1_Inference_Midmerge_Prop	(Intercept)	2.01	0.17	11.82	<0.001
	Culture_HK	−0.34	0.25	−1.36	0.17
	Expertise_Expert	0.42	0.23	1.79	0.07
	Culture_HK:Expertise_Expert	−1.40	0.38	−3.72	<0.001
Type_1_Consequence_Midmerge_Prop	(Intercept)	1.34	0.19	6.91	<0.001
	Culture_HK	−0.15	0.28	−0.55	0.58
	Expertise_Expert	0.52	0.26	1.98	0.05
	Culture_HK:Expertise_Expert	−0.99	0.40	−2.46	0.01
Type_1_Reasoning_Midmerge_Prop	(Intercept)	1.85	0.17	10.59	<0.001
	Culture_HK	−0.39	0.26	−1.51	0.13
	Expertise_Expert	0.95	0.23	4.09	<0.001
	Culture_HK:Expertise_Expert	−1.42	0.37	−3.83	<0.001
Type_2_Student_engagement_Midmerge_Prop	(Intercept)	2.03	0.17	11.93	<0.001
	Culture_HK	−0.66	0.26	−2.53	0.01
	Expertise_Expert	0.31	0.23	1.33	0.19
	Culture_HK:Expertise_Expert	−0.56	0.37	−1.53	0.13
Type_2_Student_behaviour_Midmerge_Prop	(Intercept)	0.35	0.24	1.43	0.15
	Culture_HK	−0.10	0.35	−0.29	0.77
	Expertise_Expert	0.84	0.31	2.70	0.01
	Culture_HK:Expertise_Expert	−1.17	0.48	−2.44	0.01
Type_2_Student_type_Midmerge_Prop	(Intercept)	2.05	0.17	12.15	<0.001
	Culture_HK	−0.36	0.25	−1.42	0.15
	Expertise_Expert	0.55	0.23	2.40	0.02
	Culture_HK:Expertise_Expert	−1.32	0.37	−3.61	<0.001
Type_2_Teacher_perspective_Midmerge_Prop	(Intercept)	2.45	0.16	15.30	<0.001
	Culture_HK	−1.08	0.25	−4.26	<0.001
	Expertise_Expert	0.26	0.22	1.17	0.24
	Culture_HK:Expertise_Expert	−0.26	0.36	−0.72	0.47
Type_3_Extra-present_time_Midmerge_Prop	(Intercept)	2.47	0.16	15.51	<0.001
	Culture_HK	−2.12	0.29	−7.28	<0.001
	Expertise_Expert	0.72	0.22	3.30	<0.001
	Culture_HK:Expertise_Expert	−0.92	0.41	−2.22	0.03
Type_3_Present_time_Midmerge_Prop	(Intercept)	2.72	0.16	17.52	<0.001
	Culture_HK	−3.20	0.32	−9.92	<0.001
	Expertise_Expert	0.15	0.22	0.68	0.49
	Culture_HK:Expertise_Expert	−0.02	0.45	−0.04	0.97
Type_5_Affect_Midmerge_Prop	(Intercept)	1.74	0.18	9.72	<0.001
	Culture_HK	−2.43	0.34	−7.13	<0.001
	Expertise_Expert	0.47	0.24	1.94	0.05
	Culture_HK:Expertise_Expert	−0.84	0.48	−1.73	0.08
Type_5_Relational_links_Midmerge_Prop	(Intercept)	3.32	0.15	22.55	<0.001
	Culture_HK	−2.28	0.26	−8.90	<0.001
	Expertise_Expert	0.60	0.20	2.91	<0.001
	Culture_HK:Expertise_Expert	−0.99	0.37	−2.65	0.01

6.1. Culture predicted teacher cognition at the process-level (RQ1)

Culture played an important role in teacher cognition at the process-level, as revealed by own-perspective gaze-cued think-aloud.

At the higher level, UK teachers discussed cognitions more than Hong Kong teachers. From Model 1, culture emerged to significantly predict all five cognitive themes, with teachers in the UK reflecting significantly more than teachers in Hong Kong throughout ($b = -1.26$ to -3.55, s.e. $= 0.33$ to 0.37, $z = -3.82$ to -10.00, $p < .001$). From Model 2, UK teachers reflected more than Hong Kong teachers on perception, student engagement, the teacher perspective, the extra-present time, the present time, on classroom affect, and on relational links ($b = -0.47$ to -3.20, s.e. $= 0.24$ to 0.34, $z = -1.92$ to -9.92, $p < .001$ to 0.05).

What Hong Kong teachers reflected more than UK teachers on was revealed at the granular level of Model 3. Hong Kong teachers discussed more than UK teachers teacher-related inferences, classroom management, lesson structure, instructional quality, problematic behaviours, student types, and situational types ($b = 0.70$ to 1.67, s.e. $=$ 0.25 to 0.39, $z = 1.97$ to 5.60, $p < .001$ to 0.05).

6.2. Expertise effects were less powerful on teacher cognition at the process-level (RQ2)

Expertise played a role in teacher cognition at the process-level, as revealed by own-perspective gaze-cued think-aloud.

At the higher level, expert teachers discussed four out of the five overarching cognitions more than novices to exclude global processing (i.e., Type 4; $b = 1.00$ to 1.16, s.e. $= 0.32$ to 0.33, $z = 1.76$ to 3.65, $p <$ $.001$ to 0.002; Model 1). From Model 2, experts reflected more than novices on consequences, reasoning, student behaviour, student types, extra-present time, and relational links in the classroom ($b = 0.52$ to 0.95, s.e. $= 0.21$ to 0.31, $z = 1.98$ to 4.09, $p < .001$ to 0.02).

Table 3
Dirichlet regression outcomes for unmerged codes.

		b	s.e.	z	p
1.01 Perception Visual	(Intercept)	2.33	0.13	18.59	<0.001
	Culture_HK	−0.31	0.19	−1.65	0.10
	Expertise_Expert	−0.24	0.18	−1.34	0.18
	Culture_HK: Expertise_Expert	−0.57	0.29	−1.97	0.05
1.02 Perception Audio	(Intercept)	−0.12	0.26	−0.47	0.64
	Culture_HK	0.56	0.34	1.62	0.11
	Expertise_Expert	−0.36	0.38	−0.95	0.34
	Culture_HK: Expertise_Expert	−0.64	0.52	−1.23	0.22
1.03 Perception Visual Missing	(Intercept)	−0.91	0.29	−3.08	<0.001
	Culture_HK	−0.15	0.42	−0.36	0.72
	Expertise_Expert	1.39	0.37	3.80	<0.001
	Culture_HK: Expertise_Expert	−1.48	0.56	−2.63	0.01
1.04 Perception Incomprehensible Statement	(Intercept)	−0.89	0.29	−3.04	<0.001
	Culture_HK	−0.26	0.42	−0.63	0.53
	Expertise_Expert	0.19	0.41	0.46	0.65
	Culture_HK: Expertise_Expert	−0.27	0.59	−0.46	0.64
1.05 Inference Student	(Intercept)	1.88	0.14	13.19	<0.001
	Culture_HK	−0.88	0.24	−3.70	<0.001
	Expertise_Expert	0.51	0.19	2.75	0.01
	Culture_HK: Expertise_Expert	−1.83	0.38	−4.84	<0.001
1.06 Inference Teacher	(Intercept)	0.88	0.20	4.48	<0.001
	Culture_HK	0.86	0.25	3.48	<0.001
	Expertise_Expert	−0.13	0.28	−0.45	0.65
	Culture_HK: Expertise_Expert	−1.10	0.39	−2.83	<0.001
1.07 Consequence Student Learning	(Intercept)	0.38	0.23	1.69	0.09
	Culture_HK	0.04	0.32	0.12	0.91
	Expertise_Expert	0.90	0.28	3.17	<0.001
	Culture_HK: Expertise_Expert	−0.94	0.43	−2.20	0.03
1.08 Consequence Classroom Management	(Intercept)	−0.32	0.27	−1.18	0.24
	Culture_HK	0.70	0.35	1.97	0.05
	Expertise_Expert	0.95	0.34	2.78	0.01
	Culture_HK: Expertise_Expert	−2.13	0.50	−4.23	<0.001
1.09 Consequence for Behaviour	(Intercept)	−0.23	0.27	−0.87	0.39
	Culture_HK	0.06	0.37	0.16	0.88
	Expertise_Expert	0.13	0.37	0.35	0.73
	Culture_HK: Expertise_Expert	−0.35	0.53	−0.65	0.51
1.1 Explanation or Reasoning	(Intercept)	2.00	0.14	14.56	<0.001
	Culture_HK	−0.13	0.20	−0.66	0.51
	Expertise_Expert	0.96	0.17	5.53	<0.001
	Culture_HK: Expertise_Expert	−1.49	0.28	−5.24	<0.001
1.10.1 Lesson Structure	(Intercept)	−0.63	0.28	−2.21	0.03
	Culture_HK	1.16	0.36	3.24	<0.001
	Expertise_Expert	0.57	0.38	1.49	0.14
	Culture_HK: Expertise_Expert	−0.45	0.49	−0.92	0.36
1.10.2 Quality of Instruction	(Intercept)	0.13	0.24	0.55	0.58
	Culture_HK	1.60	0.29	5.60	<0.001
	Expertise_Expert	1.09	0.30	3.63	<0.001
	Culture_HK: Expertise_Expert	−2.18	0.40	−5.50	<0.001
1.11 Uncoded	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.17	0.42	−0.39	0.70
	Expertise_Expert	0.18	0.42	0.44	0.66
	Culture_HK: Expertise_Expert	−0.34	0.60	−0.58	0.57
2.04 Discipline and Rules	(Intercept)	−0.46	0.28	−1.66	0.10
	Culture_HK	−0.13	0.40	−0.33	0.74
	Expertise_Expert	0.19	0.38	0.50	0.62
	Culture_HK: Expertise_Expert	−0.32	0.56	−0.57	0.57
2.05 Norms Behaviour Problematic	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	0.98	0.39	2.53	0.01
	Expertise_Expert	0.97	0.39	2.50	0.01
	Culture_HK: Expertise_Expert	−1.66	0.55	−3.03	<0.001
2.06 Norms Behaviour Unproblematic	(Intercept)	−0.43	0.28	−1.56	0.12
	Culture_HK	−0.43	0.40	−1.07	0.29
	Expertise_Expert	0.70	0.36	1.92	0.05
	Culture_HK: Expertise_Expert	−0.79	0.55	−1.43	0.15
2.07 Norms Notable Posture	(Intercept)	−0.91	0.29	−3.10	<0.001
	Culture_HK	0.15	0.41	0.37	0.71
	Expertise_Expert	0.44	0.40	1.08	0.28
	Culture_HK: Expertise_Expert	−0.47	0.58	−0.82	0.41
2.08 Type of Student	(Intercept)	−0.23	0.27	−0.88	0.38
	Culture_HK	1.67	0.31	5.33	<0.001
	Expertise_Expert	1.28	0.32	3.96	<0.001
	Culture_HK: Expertise_Expert	−2.47	0.43	−5.70	<0.001
2.09 Type Situation	(Intercept)	−0.04	0.25	−0.17	0.87
	Culture_HK	1.03	0.32	3.23	<0.001
	Expertise_Expert	0.58	0.33	1.75	0.08
	Culture_HK: Expertise_Expert	−1.18	0.45	−2.63	0.01
2.1 Commentary Contextised	(Intercept)	1.86	0.14	12.97	<0.001
	Culture_HK	−2.47	0.32	−7.78	<0.001
	Expertise_Expert	0.44	0.19	2.33	0.02
	Culture_HK: Expertise_Expert	−0.28	0.44	−0.64	0.53
2.11 Commentary Generalised	(Intercept)	−0.68	0.29	−2.39	0.02
	Culture_HK	0.11	0.40	0.27	0.79
	Expertise_Expert	0.15	0.40	0.38	0.70
	Culture_HK: Expertise_Expert	−0.08	0.56	−0.15	0.88
2.16 Uncoded	(Intercept)	−0.89	0.29	−3.04	<0.001
	Culture_HK	−0.26	0.42	−0.63	0.53
	Expertise_Expert	0.29	0.41	0.71	0.48
	Culture_HK: Expertise_Expert	−0.45	0.59	−0.76	0.45
3.01 Retrospection	(Intercept)	−0.28	0.27	−1.06	0.29
	Culture_HK	−0.60	0.40	−1.52	0.13
	Expertise_Expert	0.27	0.37	0.73	0.46
	Culture_HK: Expertise_Expert	−0.28	0.56	−0.50	0.62
3.03 Prospection	(Intercept)	−0.51	0.28	−1.82	0.07
	Culture_HK	0.48	0.38	1.26	0.21
	Expertise_Expert	0.20	0.39	0.51	0.61
	Culture_HK: Expertise_Expert	−0.37	0.53	−0.69	0.49
3.04 Continuation	(Intercept)	2.56	0.12	21.58	<0.001
	Culture_HK	−3.17	0.31	−10.32	<0.001
	Expertise_Expert	0.74	0.15	4.77	<0.001
	Culture_HK: Expertise_Expert	−0.81	0.43	−1.87	0.06
3.05 Uncoded	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.17	0.42	−0.39	0.70
	Expertise_Expert	0.39	0.41	0.95	0.34
	Culture_HK: Expertise_Expert	−0.55	0.59	−0.92	0.36
4.01 Viewpoint Single	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.17	0.42	−0.39	0.70
	Expertise_Expert	0.18	0.42	0.44	0.66
	Culture_HK: Expertise_Expert	−0.24	0.60	−0.40	0.69
4.02 Viewpoint Multiple	(Intercept)	0.53	0.22	2.42	0.02
	Culture_HK	−0.85	0.35	−2.45	0.01
	Expertise_Expert	−0.04	0.31	−0.13	0.90
	Culture_HK: Expertise_Expert	−0.41	0.50	−0.82	0.41
4.03 Perspective Highly Integrated	(Intercept)	−0.56	0.28	−1.99	0.05
	Culture_HK	−0.35	0.41	−0.86	0.39
	Expertise_Expert	0.72	0.37	1.93	0.05
	Culture_HK: Expertise_Expert	−0.58	0.56	−1.04	0.30
4.04 Perspective Partially Integrated	(Intercept)	−0.21	0.26	−0.78	0.43
	Culture_HK	−0.48	0.39	−1.23	0.22
	Expertise_Expert	−0.41	0.39	−1.06	0.29

(*continued on next page*)

Table 3 (*continued*)

		b	s.e.	z	p
	Culture_HK: Expertise_Expert	−0.22	0.57	−0.39	0.70
4.05 Perspective Nonintegrated	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.17	0.42	−0.39	0.70
	Expertise_Expert	0.18	0.42	0.44	0.66
	Culture_HK: Expertise_Expert	−0.24	0.60	−0.40	0.69
4.06 Scope Continuous Time	(Intercept)	0.53	0.22	2.42	0.02
	Culture_HK	−1.02	0.35	−2.89	<0.001
	Expertise_Expert	−0.04	0.31	−0.13	0.90
	Culture_HK: Expertise_Expert	−0.24	0.51	−0.47	0.64
4.07 Scope Discontinuous Time	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.06	0.42	−0.15	0.88
	Expertise_Expert	0.18	0.42	0.44	0.66
	Culture_HK: Expertise_Expert	−0.34	0.59	−0.57	0.57
4.08 Certain	(Intercept)	0.53	0.22	2.42	0.02
	Culture_HK	−1.18	0.36	−3.28	<0.001
	Expertise_Expert	−0.20	0.32	−0.64	0.52
	Culture_HK: Expertise_Expert	0.08	0.52	0.15	0.88
4.09 Uncertain	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.06	0.42	−0.15	0.88
	Expertise_Expert	0.27	0.41	0.66	0.51
	Culture_HK: Expertise_Expert	−0.43	0.59	−0.72	0.47
4.1 Uncoded	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.17	0.42	−0.39	0.70
	Expertise_Expert	0.18	0.42	0.44	0.66
	Culture_HK: Expertise_Expert	−0.34	0.60	−0.58	0.57
5.02 Relational Links	(Intercept)	2.83	0.11	25.44	<0.001
	Culture_HK	−3.92	0.32	−12.27	<0.001
	Expertise_Expert	0.57	0.15	3.88	<0.001
	Culture_HK: Expertise_Expert	−0.73	0.45	−1.63	0.10
5.02.1 Student to Student	(Intercept)	−0.18	0.26	−0.67	0.50
	Culture_HK	−0.77	0.40	−1.96	0.05
	Expertise_Expert	0.14	0.36	0.39	0.70
	Culture_HK: Expertise_Expert	−0.32	0.56	−0.58	0.56
5.02.2 Student(s) to Group	(Intercept)	−0.28	0.27	−1.04	0.30
	Culture_HK	−0.81	0.40	−2.01	0.05
	Expertise_Expert	1.28	0.33	3.92	<0.001
	Culture_HK: Expertise_Expert	−1.37	0.54	−2.56	0.01
5.02.3 Teacher to Student(s)	(Intercept)	2.69	0.12	23.35	<0.001
	Culture_HK	−1.33	0.20	−6.52	<0.001
	Expertise_Expert	0.55	0.15	3.58	<0.001
	Culture_HK: Expertise_Expert	−1.16	0.31	−3.77	<0.001
5.03 Uncoded	(Intercept)	−0.99	0.30	−3.35	<0.001
	Culture_HK	−0.17	0.42	−0.39	0.70
	Expertise_Expert	0.18	0.42	0.44	0.66
	Culture_HK: Expertise_Expert	−0.34	0.60	−0.58	0.57

Experts continued to reflect more at the micro-level of the unmerged codes (Model 3)—a pattern that encompassed perceptual capacity for missing visual information, student-related inferences, student learning, classroom management, explanations, instructional quality, problematic behaviour, student type, contextualising one's behaviour, seeing the continuous nature of events, an integrated perspective, and some relational links (b = 0.44 to 1.39, s.e. = 0.15 to 0.39, z = 1.93 to 5.53, p < .001 to 0.05).

6.3. Culture interacted with expertise to some extent in predicting teacher cognition at the process-level (RQ3)

Culture interacted with expertise to significantly predict some teacher cognitions.

At the higher level, culture-specific expertise featured in teacher cognitions encompassing perception, themes, timescales, and classroom relationships (b = −1.07 to 1.68, s.e. = 0.47 to 0.50, z = −2.12 to −3.45, p < .001 to 0.03; Fig. 1). From Model 2, culture-specific expertise emerged in teacher cognitions regarding inferences, consequences, reasoning, student behaviour, student types, extra-present time, relational links (b = −0.92 to −1.42, s.e. = 0.37 to 0.48, z = −2.22 to −3.72, p < .001 to 0.03; Fig. 2).

Culture-specific expertise continued to emerge at the micro-level of the unmerged codes for teacher cognition (Model 3). Culture significantly interacted with expertise in teachers' commentaries on visual perception, missing visual information, student- and teacher-related inferences, student learning, classroom management, explanations, instructional quality, problematic behaviours, student types, and situational types (b = −0.58 to 2.47, s.e. = 0.28 to 0.56, z = −1.97 to −5.70, p < .001 to 0.03).

Taken together, East Asian teacher expertise is demonstrated through well-prioritised perceptions and interpretations (Type 1), with experts making fewer inferences and employing more reasoning than novices. East Asian expertise was also shown via richness of thematic reflections (Type 2), with experts discussing student behaviour more and student types less than novices. On the other hand, Western European teacher expertise is conveyed through well-prioritised timescale-related reflections (Type 3), with experts reflecting more on time generally and outside of the eye-tracked lesson. Western European experts also considered classroom relationships in greater detail than novices (Type 5), especially regarding relational links across the classroom (Figs. 1 and 2).

7. Discussion

The present study sought to investigate cultural values in action during classroom instruction. To supplement existing survey and interview research on comparative cultural studies, we prompted teacher cognition via non-reactive and non-inferential means: namely, think-aloud elicited by gaze-cued own-perspective videos of participating teachers' classroom instruction. We went further by employing the expert–novice comparative design to uncover where culture has taken root in teacher cognition. In doing so, we found cultural differences to emerge comprehensively across teacher cognitions (RQ1). We also found expertise differences and a significant culture × expertise interaction across the teacher cognitions analysed, except for global processing (Type 4; RQ2 & RQ3).

7.1. Expert teaching processes can be culture-specific

The present study found some support for previous survey and interview research on cultural values in classroom instruction (RQ1, RQ3). East Asian inter-dependence is associated with holistic cognition in previous research (Varnum et al., 2010). The present study lent support to these areas when Hong Kong experts conceptualised classroom actions and events in terms of consequences more often than UK experts did. The holistic cognition expected of East Asian experts (Abel & Hsu, 1949) was found in their comprehensive thematic coverage during their think-aloud reflections. Also expected was the foregrounding of socio-emotion among Western European experts as compared with East Asian expert teachers (Markus & Kitayama, 1991): this was corroborated in the present study when Western European experts discussed classroom affect and relationships significantly more than East Asian counterparts.

Where the present work did not meet expectations was in teachers' cognitions regarding timescales. In contrast to prior expectations (Minkov & Hofstede, 2012), expert teachers in Hong Kong focused on the present moment and UK teachers more on the long-term. However, this may be evidence that experts have built up the relevant professional knowledge to recognise which cultural tendencies to mindfully exercise in moderation, so as not to mindlessly enforce cultural norms at all costs.

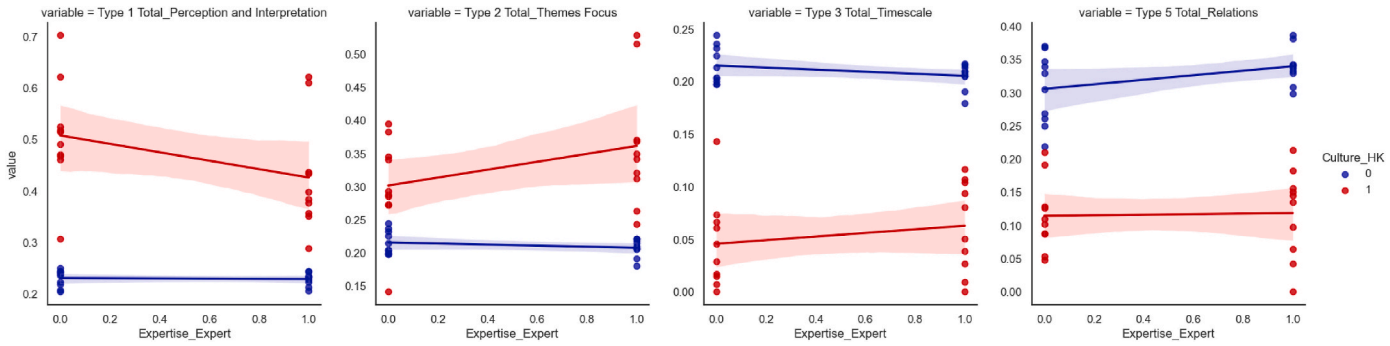

Fig. 1. Culture x Expertise as a significant term for full-merge themes (Culture: 1 = Hong Kong, 0 = UK; Expertise: 1 = Expert, 0 = Novice).

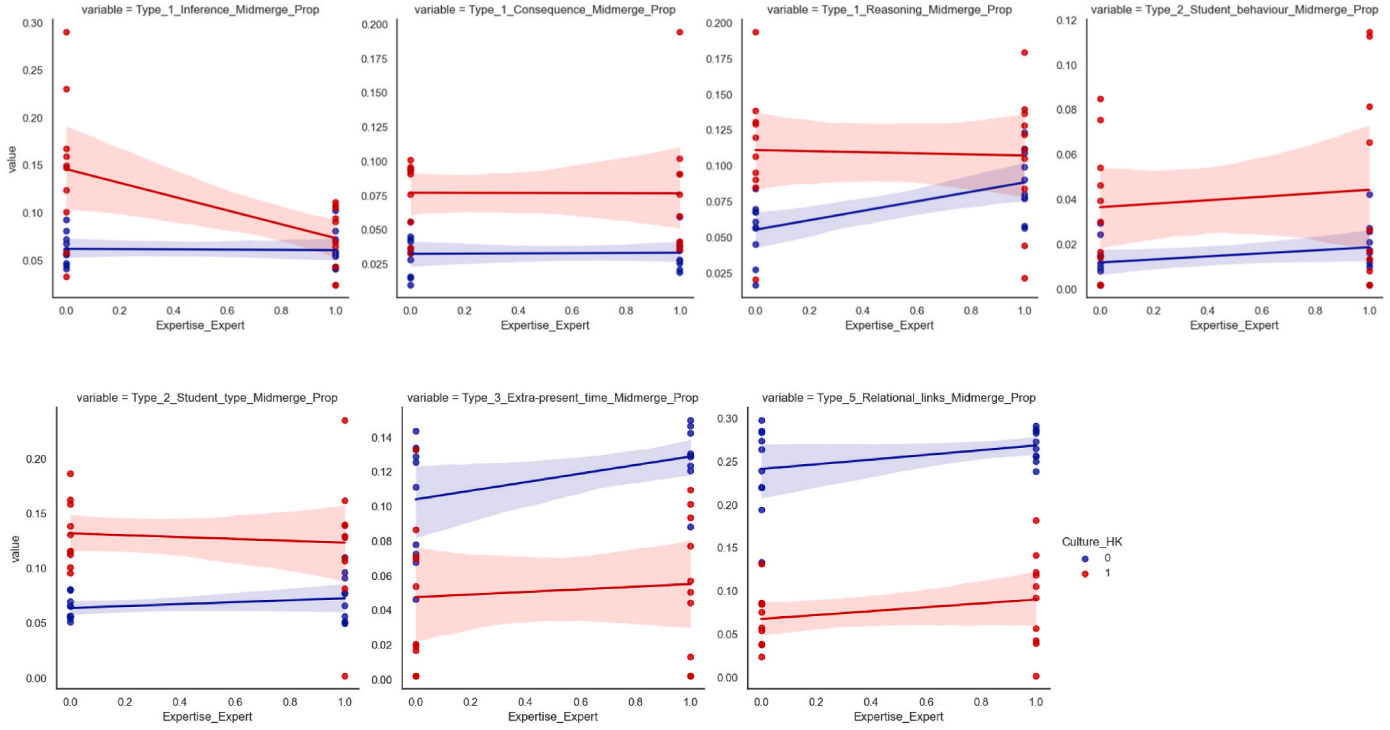

Fig. 2. Culture x Expertise as a significant term for mid-merge themes (Culture: 1 = Hong Kong, 0 = UK; Expertise: 1 = Expert, 0 = Novice).

In particular, these two aspects echo existing documentation of universal teacher expertise being characterised by situational responsiveness (or flexibility) to students' needs and classroom events—an insight uncovered through process-tracing methodology (McIntyre et al., 2017). More widely, these point to a body of instructional values that may be shared by expert teachers regardless of culture, thus bypassing cultural differences.

7.2. *Expert teaching processes can transcend culture*

Indeed, the present study found teacher values that apparently supersede culture (RQ2). Expert teachers go beyond perception to employ explanations and reasoning; they take an integrative perspective on classroom situations, holding them as part of continuous events. This supports the widely documented importance given to pedagogical knowledge and professional reflection in teacher expertise. For this, professional experts typically possess superior memory capacity (Ericsson & Kintsch, 1995) and substantially more complex representations of knowledge (Chassy & Gobet, 2011). In teaching, this advanced knowledge can translate into greater readiness to respond to students, with more sophisticated improvisations in response to classroom challenges—and greater reflectiveness on such events (Borko & Livingston, 1989).

The importance of expansive reflection and consideration in teacher expertise was supported in this study by experts thinking and operating beyond rules—and contextualising student behaviours into the students' individual and whole-class biographies. Expert teachers are well documented to prioritise individual students' learning needs, progress, and mastery—in other words, student-centredness takes priority, regardless of culture: a finding previously reported from interview, (Schempp et al., 1998), eye-tracking (McIntyre et al., 2017), and own-perspective gaze-elicited think-aloud (Miller et al., 2024) studies. This was in contrast to novice teachers who revealed rule-based classroom cognition in the present work. Our finding corroborated evidence elsewhere that novice teachers are particularly susceptible to perceived rules, both in their views of their teacher identity (Jiang et al., 2021; Xu, 2012) and in their views of teacher–student relationship (or classroom management, Johnson, 1994).

The reliance upon rules is understandable as novices are otherwise uncertain, which they indicated in the present study. When not expressing uncertainty, we found novice teachers to refer to events before and after the event in focus in order to justify and defend

themselves—a further, if unintended, sign of their need for confidence grounded in professional experience. Though unsurprising, this uncertainty found at the process-level provides valuable substantiation of prior survey-based research where novices have shown limited confidence (Clark & Newberry, 2019) coupled with an over-estimation of their own classroom competency—possibly out of the need for self-promotion or justification (Norton, 2019).

8. Conclusions

In conclusion, prior patterns of culture-specific teacher cognition were supported at the process-level via our methodology: that is, teachers' think-aloud elicited by gaze-cued own-perspective videos. Specifically, we found existing aggregate-level evidence for holistic cognition and the placement of socio-emotion in the background among East Asians to be reinforced and supported by our analyses of teacher cognition at the process-level. We also uncovered the way in which expert teachers limit established cultural values to prioritise student-centredness above all: in particular, the cultural values of holistic cognition and long-term orientation were exercised in moderation to enact student-centredness through situational flexibility (McIntyre et al., 2017). The confidence to recognise when and how to prioritise students over general cultural and professional rules is one that grows with teacher expertise.

8.1. Implications

To date, comparative studies of teacher expertise are sparse, let alone those that investigate the process-level of teacher cognition. The present study makes a significant contribution in this regard, with implications for future work. First, teacher educators should be mindful that the cultural appropriateness in much of the existing teacher effectiveness literature is finite. Recognition of the need to decolonise and decentre pedagogical guidance from the Western framework is taking root (e.g., Lipscombe et al., 2021), but alternative empirical evidence has yet to gain momentum—especially as we await the maturity and scalability of the relevant research. This entails focusing and increasing research efforts among under-researched populations around the world.

Second, those engaged in teacher professional development might pay attention to the nature of the teacher data, the way it is collected and how it is analysed. The more process-level detail is available from a research initiative, the more nuanced the insights can be: as demonstrated in the present article, one cultural value can be supported at one level of teacher cognition, but unsupported at another level to enact a higher priority. In this way, cultural sensitivity is both highlighted and buffered, in research such as this, in correspondence with the complexities of classroom instruction in the real-world. Accordingly, we encourage increased process-level approaches to understanding and investigating teacher cognition in real-world classrooms.

8.2. Limitations

Before we close, we address potential concerns regarding our research approach. First, that coders may be insufficiently objective due to each country's think-aloud data being transcribed and coded by researchers who live in the respective regions. Our response is that, on the contrary, the validity of any coder and researcher would need to be familiar with the complexities of the country context under investigation. In fact, employing a cultural 'insider' is recognised as a preferred approach in country comparative research, to leverage advantages from a shared language (Irvine et al., 2008), to optimise cultural and racial awareness (Milner, 2007), and to avoid historical and eco-political divides between participant and researcher (Shah, 2004).

A second potential concern is the confound of uncovering participants' cognitions by eliciting participant responses to videos of their own teaching. Experimental researchers in the community will point to social desirability bias and introspection as primary threat to validity among others (e.g., Schooler, 2011). Our response is that, although this own-perspective approach to video-elicited reflection is not a comprehensively advantageous and rigorous avenue for cognitive insights, the approach does hold its own—important—strength which is unmatched by alternatives. Specifically, this perspective is not only an immersive one for the head-mounted angle it takes but also for the richness of contextual and biographical information that the approach grants to the teacher as they report their cognitive processes. No other design better accesses teachers' knowledge of the school and country context, the individual pupils' needs, as well as the curriculum context. For a further, expansive analysis of the specific advantages to this research approach, see McIntyre et al. (2022).

CRediT authorship contribution statement

Nora A. McIntyre: Writing – review & editing, Writing – original draft, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Phyllis Lau:** Formal analysis. **Davy Tsz-Kit Ng:** Writing – review & editing, Supervision, Formal analysis.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.learninstruc.2025.102170.

Data availability

Data will be made available on request.

References

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