

Workplace Learning in China: Transferring Training Into Practice to Improve Performance

Xingheng Wang¹, Weihan Lin¹, Tianwen Xue², Adam Green³, Limin Gu¹, Yansheng He¹, Xiaoshan Huang⁴, Zilu Jin⁵, Yihua Wu^{*5}

¹*Novartis Pharmaceuticals (China), No. 4218 Jinke Road, Zhang jiang Hi-Tech Park, Pudong, 201206 Shanghai, China*

²*Zhejiang Haisen Pharmaceutical (China), Room 401, No. 11 Building, Fengye Apartment, Lane 533 Xinshi Nan Rd, Hongkong District, 200000 Shanghai, China*

³*Southern Illinois University Carbondale, 1263 Lincoln Dr, Carbondale, IL 62901, USA*

⁴*McGill University, 845 Rue Sherbrooke O, Montréal, QC H3A 0G4, Canada*

⁵*Shanghai Delightgo Internet Technology Co., Ltd, No 550 Hongqiao Road, Xuhui District, 200032 Shanghai, China*

Received: 11 February 2022, Accepted: 01 July 2022

Abstract

Purpose: The present study seeks to examine the efficacy of different training modalities on increasing workplace learning, representatives' intent to transfer what they learned into their work, and importantly how training impacts actual work performance. These relationships are tested in the context of a Chinese division of a multinational pharmaceutical company, where pharmaceutical representatives are tasked with relaying relevant efficacy and safety information on pharmaceutical products to health care professionals who prescribe them to patients.

Methods: The present study employed a three-group between-subjects experimental design. Representatives received varying forms of training (instruction only, instruction plus reflection, and instruction, reflection, plus direct feedback; Gibbs, 1981; Gibbs & Simpson, 2005) based on experimental conditions. After three training sessions over the course of six weeks,

*Corresponding author: vic.wu@delightgo.com



representatives were assessed on how much they learned in the training and their actual work performance through observer assessment of meetings with health care professionals, facilitated by the representatives.

Findings: In this study, it was found that the process of actively reflecting on what was learned in training led to increased learning, as well as increased performance, compared to simply studying the material. However, receiving direct feedback on training performance, combined with active reflection training, did not provide any further benefits in terms of learning or work performance. Notably, there were no differences in intent to transfer learned material to work, as all conditions reported high levels of transfer intention.

Conclusion: The finding provides insightful evidence to support the benefits of fostering trainees' active reflections for work-based learning in the Chinese industry training scenario. In contrast, receiving direct comments on how students performed from a manager or trainer, as well as advise on how do better in the future, had no effect on increasing learning or performance. Although the effect of direct feedback is not statistically significant in this context, further research should be done in understanding individuals' thoughts and behaviors when received direct feedbacks received in workplace training. Relatively little workplace research has assessed both workplace learning and performance in the same study, specifically in the Chinese context. While training efficacy likely varies across cultures to begin with, compensation structures in China do not provide the same monetary incentives for workplace learning (i.e. chance to increase income) as Western culture. This means that any way to increase workplace learning should be of extra value, as employees otherwise may not engage in it at all.

Keywords: Transfer of Training, Performance, Workplace Learning, Self-Directed Learning, Vocational Education and Training, VET

1 Introduction

Learning is something humans do throughout their lifespans. Learning is most closely associated with school, but happens at home, in social situations, and in the workplace. Perhaps because of this association with school, many adults assume that once they are done with school, they are done learning; they have paid their dues to education. However, recognizing that workplace learning is beneficial and pursuing learning opportunities are both necessary for successful development of employees (Matthews, 1999). In China, the formalized practice and study of workplace learning is relatively new (Liu et al., 2020). China is one of the world's largest economies, with around 800 million workers in total (The World Bank, 2022). If the fundamental assumption of workplace learning is true, that employees who engage in

workplace learning will outperform those who do not, due to their increased knowledge, skills, and abilities (Hager, 2005), the optimization of workplace learning programs in the Chinese context will lead to distinct advantages for firms that utilize it.

The assumption that workplace learning leads to increased workplace performance depends on the willingness of the employee to put what they have learned into practice. In other words, they must have the intention to transfer what they have learned into their workplace tasks (Yamnill & McLean, 2001). Blume et al. (2019) proposed a dynamic theory of training transfer which posits that employees' attempts to transfer learned material to practice need to be supported through feedback and allowed time to adjust to the new methods of carrying out their tasks. This model is notable for proposing multiple iterations of learning and transfer opportunities when measuring the efficacy of a training program.

Thus, the goal of the present study is to assess which workplace training methodologies are most effective at not only increasing knowledge but also workplace performance in Chinese workplaces. Specifically, the present study poses the following question: "When seeking to train employees who are not necessarily 'new' on the job, what methods are most effective in facilitating learning, and subsequent transfer of that learned information or skills into practice (specifically in a Chinese context)?"

Transfer of Training

While learning for learning's sake is certainly a noble goal on its own (in an academic's opinion, that is), the end goal of most workplace learning programs is to facilitate performance gain. To translate training into practice, the knowledge, skills, and/or abilities (KSAs) gained from training must be transferred into the actual job context (Blume et al., 2010). While some research has directly measured performance, still too many studies focus solely on learning outcomes only (Baldwin et al., 2017). Without an accurate picture of the mechanisms animating the process of turning learned KSAs into actual increases in work performance, massive investments in workplace learning programs, on the part of large corporations, risk being completely wasted (Ford et al., 2018).

The message made clear by prior research is that studies should emphasize both learning and related performance outcomes, and should ideally be conducted in real work settings with real employees (Baldwin et al., 2017; Blume et al., 2010; Ford et al., 2018). Research conducted in this manner adds to the generalizability of the relationship between workplace learning and job performance.

1.1 Intent to Transfer Training

A primary driver of whether material learned in training is actually transferred into practice is the extent to which the learner intends to incorporate what they have learned into their work; which is known as the Intent to Transfer Training (Gegenfurtner et al., 2009). The

learner is ultimately in control of their own actions in most circumstances encountered in a workplace training context. Therefore, it makes fundamental sense as to why it would be important to follow workplace training practices which promote engagement and buy-in from the learners, which will lead to higher rates of intent to transfer the learned material into their jobs (Curado et al., 2015; Wen & Lin, 2014a).

Past research on program features which promote transfer intentions, via learner engagement and buy-in, include critical thinking-oriented reflection tasks and direct feedback from supervisors/teachers (Gibbs & Simpson, 2005). Additionally, programs which support high self-efficacy in the learners, often by providing a supportive environment for training transfer in addition to the training itself, are associated with higher intent to transfer training, regardless of specific features of the program (Islam, 2019; Khan et al., 2015; Wen & Lin, 2014b).

1.2 Training Methods to Improve Learning/Performance

Much prior research has focused on what features of training programs lead to the most learning and, through transfer, performance (Blume et al., 2010; Blume et al., 2019; see Gegenfurtner et al., 2009). Two facets of training stand out, based on principles laid out by Gibbs and colleagues: Engaging in active learning through reflecting on the material covered in training and receiving direct feedback and advice from supervisors (Gibbs, 1981; Gibbs & Simpson, 2005; Hinrichs, 2014). While school education emphasises a more broad-based development of subject domain knowledge, work-based training is more task-oriented (Anseel et al., 2009), focusing on specific professional skills that must be applied well in specific positions; however, both sites share similar learning objectives for the processes and outcomes.

Reflections and feedbacks are two main interventions that have been applied in various educational context (for critical thinking of novice nurses, see Forneris & Peden-McAlpine, 2007; capacity of midwifery students, see Sweet et al., 2019; for medical students, see White et al., 2009) to improve student-centre task performance. One of the previous studies compared prompts with a purely reflective effect and reflective prompts grounded in self-regulated learning, which effectively improve the reflective process (van den Boom et al., 2004). Further, consistent self-reflections and peer feedback are addressed to be beneficial in groupwork and growth in problem-based group learning (Holen, 2000). Moving from school-sites to work-place training, reflections and feedbacks are playing essential roles in performance; therefore, it is essential to apply appropriate intervention that foster active reflection and instant feedback.

1.2.1 Active Reflection

Reflection is an important phase in self-regulated learning (SRL) frameworks (Pintrich, 1995; Winnie & Hadwin, 1998; Zimmerman, 1989). According to Zimmerman (1989), SRL is a cyclical learning processes containing three phases, namely forethought (understand the task, set goals, and plan for achieving goals), performance (adapt to appropriate strategies throughout the task), and self-reflection (reflect on the whole process and internalize knowledge and skills learned in the task for further study). SRL has been proved to be effective strategies in driving deep learning processes and better performance outcomes (Azevedo et al., 2004; Greene et al., 2010; Ifenthaler, 2020). Researchers are investigating ways to promote self-regulated learning behaviours in learners. Recent studies have begun to investigate the three stages of SRL on a micro-level; for example, high performers exhibited more after-thought phase of SRL (e.g., monitoring) strategies, while low performers tended to orient and reorient (forethought phase of SRL) throughout the task (Lajoie et al., 2021). In another study, Lajoie et al. (2018) and colleagues find out that high performers spend more time than lows in a subcategory of the reflection phase. Interestingly, it could be extremely exciting to encourage the use of higher-level SRL strategies such as reflections to better support learners' higher performance. Gibbs (1981) gives six 'stages' of the reflection cycle that should be completed in order to obtain maximum understanding and internalization of the learned material: 1) Description of the material, 2) Feelings toward the material, 3) Evaluation of the learning process, 4) Analysis of the material (i.e., why it was important to learn), 5) Conclusion about the material, and 6) Plan for implementation of material into practice.

1.2.2 Direct Feedback

Gibbs and Simpson (2005) also discuss the importance of direct feedback from supervisors in the learning and transfer processes. Feedback increases self-efficacy and engagement with the training material, and is thought to be the single largest influence on achievement, at least when it comes to student learning outcomes in traditional scholastic environments (Gibbs & Simpson, 2005; see also Winstone et al., 2017). However, it should be noted that the feedback studied by Gibbs and others primarily refers to private feedback, rather than publicly known feedback (i.e., peers do not see/hear the feedback given). Gibbs and Simpson (2005) also reported that learners often disregarded feedback when they performed poorly or if the feedback was overly harsh. Further, there are also some debates about the effects of direct and indirect feedback. Some scholars believe that direct feedback is more beneficial than indirect feedback (Elashri, 2013; Hashemnezhad & Mohammadnejad, 2012), whereas others believe that indirect feedback has a greater impact on students (Jamalinesari et al., 2015); these studies all targeted at different groups of participants from secondary school students to adult learners. Due to the fact

that direct feedback is more effective in the context of work-based training (Gibbs & Simpson, 2005), we will examine the effect of combining reflection with direct feedback (Anseel et al., 2009) in this study.

1.3 Cross-Cultural Research on Workplace Learning

While workplace learning, and specifically transfer of said learning into practice, has long been studied in organizational psychology (Ford et al., 2018), there exists relatively little research on the topic in non-Western settings. Perhaps this can be attributed to the lack of emphasis on the subject in some Eastern cultures, such as China (see Yan et al., 2001). However, this is changing, as workplace learning is being noticed by Asian countries as a potential avenue of gaining a competitive edge over rival firms (Li & Huang, 2011; Wang et al., 2010).

In China, only a few studies have directly addressed learning in the workplace setting (Meng-Cheng & Su, 2015; Wang et al., 2021; e.g., Yan et al., 2001). The human resource development field as a whole is gaining traction in China, however, with several studies examining Chinese employee samples (Kim & McLean, 2014; Kim et al., 2006; Li & Huang, 2011). Clearly, there is a strong need to address this gap in research by studying workplace learning in Asia in general, and particularly in China.

2 Hypotheses

According to the literature review on theoretical backgrounds and empirical findings on reflections and feedbacks' positive significant influence on learning, three assumptions were made on prompting active reflection and providing direct feedbacks' effects in transfer in workplace training; specially, the three assumptions are listed below:

Hypothesis 1: Employees who are only given training sessions will learn less effectively than will employees who engage in active reflection in addition to attending training sessions, and these employees in turn will learn less effectively than will those who receive direct supervisor feedback in addition to attending training sessions and engaging in active reflection.

Hypothesis 2: The pattern of learning outcome differences predicted in Hypothesis 1 will also apply to employee performance in the work setting.

Hypothesis 3: The pattern of learning outcome differences/work performance predicted in Hypotheses 1 and 2 will also apply to the intent to transfer learned material to the work setting.

3 Methods

To examine our hypothesized, a three-group between-subjects experimental design was used in this study. We randomly assigned 192 participants in training with varying forms (i.e., instruction only, instruction plus reflection, and instruction, reflection, plus direct feedback; Gibbs, 1981; Gibbs & Simpson, 2005). We elaborated the detailed processes and measurements in the following sections.

3.1 Design

The present study employed a three-group between-subjects experimental design with pharmaceutical representatives randomly assigned to one of three conditions. Condition 1 was the "Learning-Only group", Condition 2 was the "Active Reflection" group, and Condition 3 was the "Feedback" group. The Learning-Only group received learning sessions only. The Active Reflection group received the same learning sessions as the Learning-Only group, but also completed active reflection activities to solidify and enhance their learning. The Active Reflection condition involved assigning reflections tasks based on the model proposed by Gibbs (1981), with prompts such as: "Please describe in detail the main goals of this meeting and evaluate how they have been achieved", designed to lead representatives to critically consider the function of their training and whether or not its goals were successfully achieved. The Feedback group received the same learning sessions as the Learning-Only group, completed the same active reflection activities as the Active Reflection group, but also received direct feedback on their learning from a manager who conducted a group feedback session reviewing performance in the training, as well as offering advice on how to improve as workers.

3.2 Participants

192 pharmaceutical sales representatives from a large, multi-national pharmaceutical company were recruited into the study by their employer. Representatives were 51.56% Female, most were between 26-35 years old (65.1%), and had been employed in the pharmaceutical sales industry from between five months and 20 years ($M = 7.374$, $SD = 4.193$) (see Table 1). While four experimental conditions were initially planned, managers and representatives who would have been assigned to a 'waitlist' condition wanted to be provided training as well and were therefore added to the learning-only condition, as resources did not allow for their inclusion into the other groups.

Table 1: Sample Distribution: Pharmaceutical Representatives (N=192)

variables	n	%	variables	n	%
<i>Gender:</i>			1.8	1	0.52
M	92	47.92	2.0	13	6.77
F	99	51.56	3.0	16	8.33
<i>Age:</i>			3.5	3	1.56
21-25	22	11.46	4.0	11	5.73
26-30	54	28.13	5.0	22	11.46
31-35	71	36.98	6.0	21	10.94
36-40	30	15.63	7.0	18	9.38
Over 40 years old	14	7.29	8.0	12	6.25
<i>Education level:</i>			9.0	11	5.73
3 years diploma	51	26.56	9.3	1	0.52
Undergraduate	135	70.31	10.0	20	10.42
Postgraduate	5	2.60	11.0	5	2.60
<i>Major:</i>			12.0	6	3.13
Medical related	109	56.77	13.0	7	3.65
Non-medical related	82	42.71	15.0	7	3.65
<i>Years of experience in the field of pharma sales (y):</i>			16.0	2	1.04
0.5	1	0.52	17.0	3	1.56
1.0	3	1.56	18.0	4	2.08
1.5	2	1.04	20.0	1	0.52

3.3 Measures

Throughout the workplace training period, we measured the participants' learning results, training performance, and intent to transfer in interpreting the effects of our intervention on the randomly assigned groups. The following sections described each measurement and the sequence of data collection in details.

3.3.1 Learning

Representatives' learning was assessed using a 12-item exam which included items directly related to what they had been assigned to learn, presented in multiple-choice format. The following is a translated example of a question on the exam:

Manager 'BN' was checking the preparations made by representative 'A' regarding the health care professional meeting he will hold for next week. representative 'A' said: *"I have everything ready. Host and speakers are well arranged, the PowerPoint slides and the patients' cases, applications and attendees are all ready to go"*.

What option do you think best describes BN's most likely next question?

- A. *"What is the budget for the meeting?"*
- B. *"What is the meeting host's mindset going in?"*
- C. *"What is the purpose of this meeting?"*
- D. *"What is the subject of this meeting?"*

3.3.2 Performance

Representative performance was assessed by independent coding of seven prespecified behaviors during meetings with health care professionals (i.e., clients). Coding was carried out by an independent team of three raters, who were trained by a supervisor, then watched the recorded meetings separately. The raters then met together and compared their ratings, resolving any disagreements and arriving at a final rating for each meeting. Example behaviors include a) utilizing a set of prepared questions to direct meeting conversation and b) summarizing and providing a recap of the meeting at its conclusion.

A secondary measure of performance was developed to assess performance when the representative was responsible for coaching a health care professional who was not the host of the meeting, which included responding to questions accurately in a timely manner (i.e., not needing to search notes to find answers), speaking for a substantial portion of the meeting, and actively taking initiative to guide the meeting. All behaviors were coded as '1' if observed and as '0' when not observed.

3.3.3 Intent to Transfer

Intent to transfer learned material was assessed using a Mandarin Chinese version of the 12-item Reduced Instructional Materials Motivation Survey (RIMMS) scale, adapted from prior research which has validated its use (Villena Taranilla et al., 2019; Wang et al., 2020) to the workplace training context. The RIMMS scale contains items concerning four facets of motivation to learn/utilize training: Attention paid to the training, perceived Relevance of the material to work, Confidence in their ability to improve their performance using what they have learned, and their Satisfaction with the training process as a whole. Example questions are available upon request (in Chinese and English). The reliability of this scale was quite high, as each 3-item subscale exceeded $\alpha = .975$, though this is due to severe ceiling effects (see below for more information).

3.3.4 Self-Efficacy

Representatives were asked to evaluate the extent to which they felt confident in their ability to take what they had learned and apply it in their job. Representatives rated this on a scale of 0-100, with 0 meaning no confidence whatsoever and 100 meaning maximum confidence. This measure was taken after each training session.

At the end of the experiment, representatives were also asked to retroactively rate their own abilities in performing their job as they were at the start of the experiment, on the same 0-100 scale.

3.4 Procedure

Medical representatives were randomly assigned to one of the three conditions. Representatives in the learning-only condition were given access to the instructional material only, attending learning sessions through an online learning platform. Representatives in the active reflection condition were given access to the instructional material, plus participated in brief active reflection sessions with a manager after each learning session. Representatives in the feedback condition were given access to the instructional material, participated in brief active reflection sessions with a manager after each learning session (Villena Taranilla et al., 2019; Wang et al., 2020), and they also received feedback on how they performed, as well as ways to improve going forward, from their manager in a group setting.

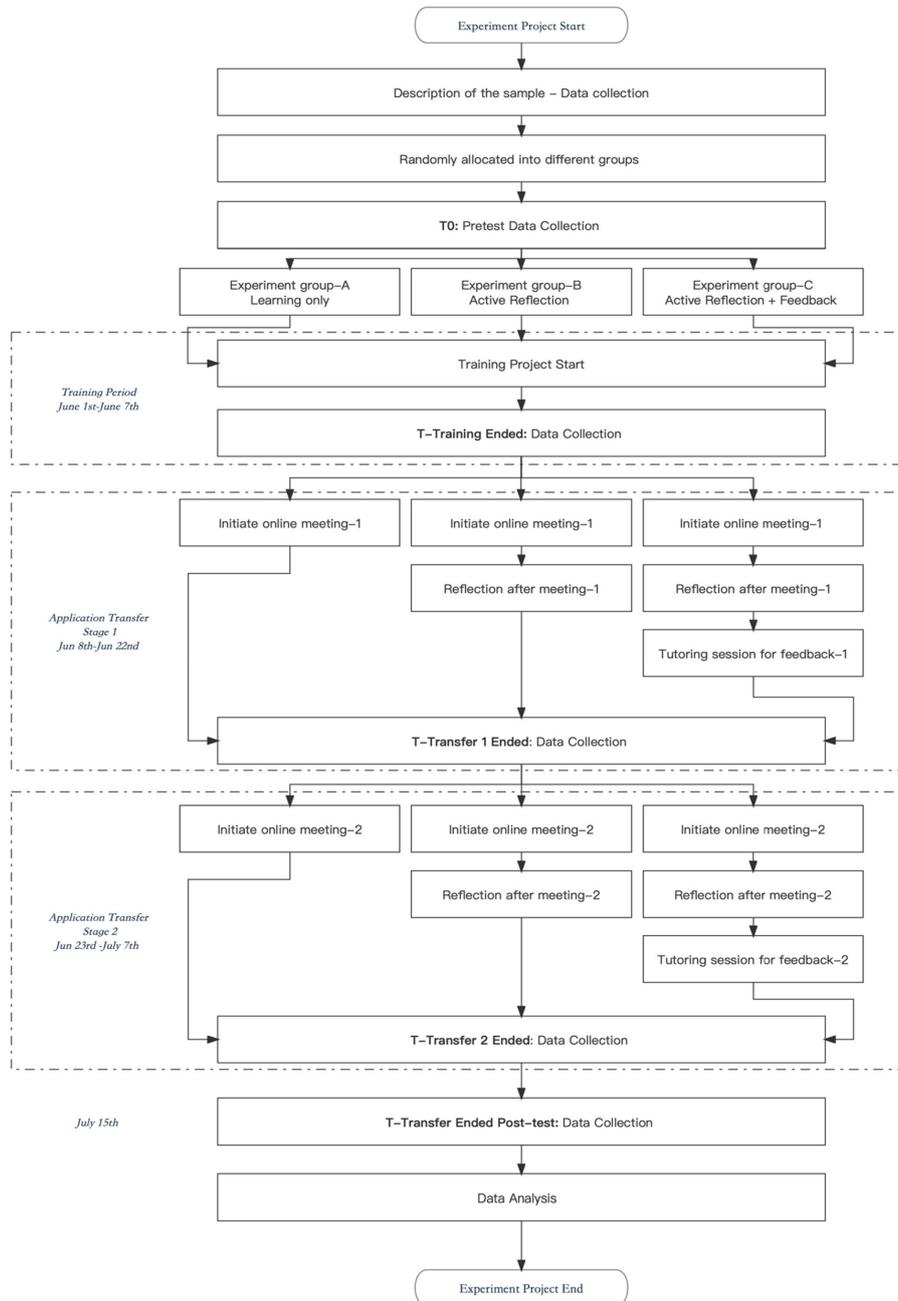
Learning sessions occurred three times, once every two weeks, lasting approximately 60 minutes each time, with the reflection/feedback activities adding approximately 15/30 minutes to that training time, respectively. Prior to, and following, each learning session, representatives were asked to report their perceived self-efficacy regarding the learned material. Additionally, following each learning session, representatives were asked to report their intentions to transfer what they learned into their work using the Attention, Relevance, Confidence, and Satisfaction (ARCS) scale which is RIMMS Chinese Version (Loorbach et al., 2015). After the final training session, representatives were given a 12-question exam covering the material that they had been learning.

To obtain measures of performance, meetings involving hospital health care professionals, arranged by the representatives, were recorded. The meetings served as means by which the company could promote and assure the safety of its products directly to medical personnel. These meetings were held online through video calls due to the COVID-19 Pandemic.

The Training Period started on the 1st of June and ended on the 7th of June. As shown in Figure 1, the meetings took place after the Training Period, from Application Transfer Stage 1 (June 8, 2021, to June 22, 2021) to Application Transfer Stage 2 (June 23, 2021, to July 7, 2021) for approximately six weeks total.

While over 100 meetings took place, only 79 were recorded due to various hospital and governmental regulations. These recordings were analyzed by a third-party team with predetermined markers to assess whether the representative had effectively facilitated the meeting

Figure 1: The Process of Experiment Conduct



4 Results

It was hypothesized that different training protocols would lead to different learning scores (Hypothesis 1) and work performance (Hypothesis 2) among pharmaceutical representatives. To test this, two univariate Analysis of Variance (ANOVA) analyses were performed comparing the three experimental conditions on learning scores and work performance. As an added measure of work performance, and thus an additional test of Hypothesis 2, three Chi-Square analyses were performed comparing the three experimental conditions on the frequency with which certain behaviors (speaking for a substantial portion of the meeting, promptly answering questions, and taking initiative in directing the flow of conversation). Additionally, it was hypothesized that different training protocols would lead to different levels of intent to transfer training into work (Hypothesis 3) for pharmaceutical representatives. To test this, a third ANOVA analysis was performed comparing the three experimental conditions on their intent to transfer scores.

4.1 Learning

Of the initial sample size of 192 pharmaceutical representatives, 38 did not take the concluding examination and were thus excluded from the analysis. This left a total sample size of 154 representatives. All remaining subjects' residual scores fell within +/- 2.5 standard deviations of their predicted scores, meaning that all were retained in the final analysis. The learning-only group contained 78, the Active Reflection group contained 41 representatives, and the Feedback group contained 39 representatives.

The ANOVA revealed a significant effect of experimental conditions on participants' final examination scores, $F(2, 155) = 8.088, p < .001, \eta p^2 = .095$. Therefore, Hypothesis 1 was supported. Post-hoc analysis using Tukey's HSD formula was conducted. Specifically, the Learning-Only ($M = 56.68, SD = 16.185$) group scored lower than either of the Active Reflection ($M = 64.61, SE = 18.090; HSD = -7.93, p = .029$) or the Feedback groups ($M = 68.49, SE = 12.685; HSD = -11.81, p < .001$). However, contrary to expectations, the Active Reflection and Feedback groups did not significantly differ from each other ($HSD = -3.88, p = .523$). See Table 1 for condition means, sample sizes, and standard deviations.

4.2 Performance

A total of 79 pharmaceutical promotion sessions were recorded throughout the course of the study. A univariate ANOVA was used to compare the experimental conditions on their performance scores during these sessions. The Learning-Only group contained 34 representatives,

the Active Reflection group contained 12 representatives, and the Feedback group contained 33 representatives.

The ANOVA revealed a significant effect of experimental conditions on participants' meeting performance scores $F(2, 76) = 10.227, p < .001, \eta p^2 = .212$. Therefore, Hypothesis 2 was supported. Specifically, and similarly to Hypothesis 1, the Learning-Only ($M = 2.74, SD = 1.421$) group scored lower than did both the Active Reflection ($M = 4.500, SD = 1.168$) and the Feedback groups ($M = 4.152, SD = 1.642$) (see Table 3). Again, and contrary to expectations, the Active Reflection and Feedback groups did not significantly differ from each other. See Table 2 for condition means, sample sizes, and standard deviations.

Additionally, the performance of speakers who assisted in meetings was also compared across groups using three Chi-Square analyses. The first analysis compared speakers on whether they satisfactorily responded to questions in a timely manner. The analysis found significant differences between groups ($\chi^2(2) = 10.241, p = .006$, Cramer's $V = .243$), such that the Active Reflection group and Feedback groups responded to questions better than did the Learning-Only group.

The second analysis compared speakers on whether they contributed a significant amount to the overall discussion in the meeting. The analysis found significant differences between groups ($\chi^2(2) = 17.281, p < .001$, Cramer's $V = .312$), such that the Active Reflection group and Feedback groups contributed to the discussion more than did the Learning-Only group.

Table 2: Mean Learning Outcome Across Conditions

Condition	<i>n</i>	Learning Score (100 = Maximum Score)	
		Mean	Standard Dev.
Learning	78	56.68	16.185
Active Reflection	41	64.61	18.090
Feedback	39	68.49	12.685
Overall	158	61.65	16.642

Table 3: Mean Performance Score Across Conditions

Condition	<i>n</i>	Host Performance Score (7 = Highest Performance)	
		Mean	Standard Dev.
Learning	34	2.74	1.421
Active Reflection	12	4.50	1.168
Feedback	33	4.15	1.642
Overall	79	3.59	1.653

The third analysis compared speakers on whether they actively took initiative in the meeting. The analysis found no significant differences between groups ($\chi^2(2) = 1.745, p = .418$, Cramer's $V = .100$), meaning that groups did not differ in whether speakers actively took initiative during the meeting. This was likely due to a lack of noted instances of initiative-taking across all groups.

4.3 Intent to Transfer

It was also hypothesized that the groups would differ in their intent to transfer their training to their work. However, there were severe ceiling effects for all groups when assessing intent to transfer. This made the analysis of group differences a moot point, as there was little observed variation in the sample overall. Therefore, Hypothesis 3 was not supported.

4.4 Exploratory Self-Efficacy Analysis

Another indicator of learning, and potentially behavior change related to performance (see Bandura, 1977; Bandura et al., 1999), is self-efficacy in performing one's job. However, accurate self-assessment requires knowledge of one's own lack of knowledge. In general, the pharmaceutical representatives rated themselves quite highly on self-efficacy measures. However, there was a sizeable amount of variation in how, when asked at the end of the study, representatives retroactively assessed their own self-efficacy at the beginning of the study. To assess whether this was due to group differences, a univariate ANOVA was run comparing the groups on their ratings of what their 'true' self-efficacy levels were, in reality, at the start of the study. In other words, this was a retroactive assessment of their own abilities prior to their training. As there were no hypotheses made about differences in self-efficacy across groups, this analysis and its results are strictly exploratory, and should therefore be interpreted with caution.

The ANOVA revealed a significant effect of experimental conditions on participants' retroactive self-efficacy scores $F(2, 148) = 5.600, p = .005$. Specifically the Learning-Only ($M = 6.48, SD = 10.81$) group scored lower than did both the Active Reflection ($M = 11.77, SD = 9.97$), and the Feedback groups ($M = 12.72, SD = 11.17$). Similarly, to the previous analyses, the Active Reflection group and the Feedback group did not differ from each other.

5 Discussion

Two of the three primary hypotheses of the study were supported (Hypotheses 1 and 2). Representatives in the Active Reflection and Feedback conditions scored higher on both learning and performance than did representatives in the Learning-Only condition. However,

conditions did not differ in their intent to transfer their training into their work (see limitations section below for likely explanations for why this occurred). This result is counter to predictions made by past research which suggests that people who learn, engage with, and attend to the contents of a training program should show higher levels of intent to transfer what they learned into practice (e.g., Blume et al., 2010). While feedback from supervisors was expected to provide some additional benefit to representative learning and performance outcomes, though no benefit was found in the present study, which is similar to findings in another Chinese sample (Wang et al., 2021). Given the support found for Hypotheses 1 and 2, the present study lends weight to the argument that workplace learning does indeed translate into work performance in the context of Chinese pharmaceutical representatives.

There are several main implications of this study. First, it has demonstrated that Chinese workers are receptive to workplace learning programs, even though there are limited incentives for workplace learning in place relative to other cultures. Second, it has demonstrated a link between workplace learning and directly observed work performance in the Chinese context. Third, employees retroactively assessed their abilities to effectively carry out their job tasks prior to learning, relative to their abilities at the end of learning, with those who engaged only in learning rating their prior abilities most positively. This indicates that they had actually gained the least knowledge over the course of the training program relative to the other groups. Last but not least, implications for assessment methods in future workplace learning are discussed.

5.1 Active Reflection

Reflecting on the study material was the component of training which showed an improvement over simply studying the material. Using activities based on Gibbs (1981), representatives were led to consider more deeply what constituted optimal performance in their job and, importantly, why performing in a certain way was optimal. The success of the active reflection intervention demonstrates that effective prompting of the reflective process is important for improving learning performance in the workplace.

5.2 Direct Feedback

In this context, receiving direct feedback from a manager or trainer as to how they performed in their training, as well as advice on how to improve in the future, was not of any benefit in increasing learning or performance. One possible explanation is, as Blume et al. (2019) mentions in his dynamic training transfer model, that the provided feedback was not completely observed and converted into trainees' own working strategies, and thus their learning and performance outcomes are not highly dependent on whether or not they receive direct

feedback. Compared with learners in school educational context, trainees who have started their early career in the workplace evaluate the usefulness of feedback in various degrees and might be more committed to their own style of working, thereby choosing not to accept the direct feedback in work-based learning. Still, managerial feedback is considered to be an important route to improved performance, so the lack of any effect here is worth noting. Future study can further examine whether the trainees actually take the feedback and make modification; moreover, it is also essential to investigate both external (i.e., environmental and interactional) and internal (i.e., psychological) factors that influence learners' behaviors in tackling with feedback.

5.3 ARCS Measure

One notable outcome of this study was the lack of differentiation in the intent to transfer learned material across conditions. The usage of the Attention, Relevance, Confidence, and Satisfaction (ARCS) (Keller, 2009) model of motivation to utilize learned material RIMMS scale (Loorbach et al., 2015) may have been ineffective in the Chinese context. While the present study used an adapted version of the scale already translated into Mandarin Chinese (Wang et al., 2020), representatives reported high levels of transfer intention across all conditions. This could be due to several factors. First, Chinese employees may be particularly acquiescent and therefore tend to exaggerate the amount that they intend to cooperate with management directives. Second, that the training involved primarily learning knowledge (rather than skills or abilities) led to little reluctance to implement what they learned. Finally, employees may have perceived a lack of anonymity for their responses. If this were the case, they would feel pressured to respond positively to any evaluation of the training program or company itself. It is possible that all three of these factors contributed to the ceiling effects seen in the present study.

5.4 Assessment Methods

Although this study proves effective intervention of active reflection on transfer in workplace learning, it is acknowledged that the transfer is a complex process. However, in this case, the transfer occurred over a two-month period, with the emphasis on the representatives' knowledge changing in a time-limited manner. And only a brief period following learning was used to gather and evaluate participants' transfer processes. While effective training on certain specialized abilities within a specified time frame is critical for organizational behavior, additional research on transfer in workplace learning should investigate the long-term transfer consequences. For instance, to review trainees' working performance on a consistent basis over a longer period of time. Apart from behavioral observations, it is recommended

to combine behavioral assessment with other forms of assessing learning achievement (e.g., questionnaires to assess acquired knowledge, think-aloud protocols to assess changes in cognitive processes, and focus group interviews to obtain peer formative feedback, etc.).

6 Conclusion and Limitations

The present study provided a rare opportunity to measure learning and performance of Chinese pharmaceutical representatives engaged in workplace learning programs. Both learning and actual performance were increased significantly by representatives engaging in active reflection about the purpose of their training. The result provides insightful evidence to support the benefits of encouraging trainees' active reflections for work-based learning in the Chinese industry training context. In contrast, receiving direct feedback on how students performed from a manager or trainer, as well as guidance on how to better in the future, had no effect on enhancing learning or performance. Although the effect of direct feedback is not statistically significant in this context, more research should be done in understanding individuals' thoughts and behaviors when received direct feedbacks received in workplace training. Overall, in the Chinese context, where workplace learning is arguably underutilized and certainly understudied, the present study contributed to the extant literature by demonstrating training methods which improve both the efficacy of workplace training initiatives and result in real gains in work performance.

One limitation of the measures of performance used in the present study was the limited availability of meeting recordings. Approximately half of the meetings which took place were available to coders, meaning that half of the meetings were not rated, greatly reducing sample size and statistical power. However, the ANOVA analysis of performance, while containing unequal group sizes (see Table 1), did not violate any statistical assumptions: For example, the assumption of equal variances across groups was met (Levene's Test $p = .128$), and residual plots showed no distinct patterns in errors. However, due to the unequal cell sizes in the performance analysis, the results should be interpreted with some caution.

One primary feature of the Dynamic Transfer Model (Blume et al., 2019) is the assessment of learning after each opportunity for transfer of training. In the present study, there were two opportunities to transfer training, once midway through the training program, and once after training had concluded. Learning, as well as intent to transfer training, was measured at both times. However, the exam used to measure learning midway through the training program showed very high scores across all conditions (likely due to representatives having just learned the material immediately beforehand), and was therefore not useful for analysis due to ceiling effects. Thus, the ability of the present study to adequately test the Dynamic Transfer Model in its entirety is limited. This limitation is compounded by the ceiling effects observed in the intent to transfer measure which was used. The intent to transfer ceiling

effect is most likely due to social desirability bias on the part of the representatives, as well as the identifiable nature of the data (representative names were linked with their responses due to practical considerations involving the assignment of managers to training conditions).

In spite of these limitations, due to the unique nature of the sample, the measurement of both learning and performance, and the truly experimental design used with random assignment, the present study retains more than enough value to contribute to the body of literature regarding effective workplace learning practices.

Acknowledgement

The authors wish to thank the anonymous reviewers, associate editors, and editors for their thoughtful reviews and suggestions for this manuscript. The appreciation shall be also given to Novartis Pharmaceuticals (China), and anyone engaged in this work.

References

- Anseel, F., Lievens, F., & Schollaert, E. (2009). Reflection as a strategy to enhance task performance after feedback. *Organizational Behavior and Human Decision Processes*, *110*(1), 23–35. <https://doi.org/10.1016/j.obhdp.2009.05.003>
- Azevedo, R., Guthrie, J. T., & Seibert, D. (2004). The role of self-regulated learning in fostering students' conceptual understanding of complex systems with hypermedia. *Journal of Educational Computing Research*, *30*(1–2), 87–111. <https://doi.org/10.2190/DVWX-GM1T-6THQ-5WC7>
- Baldwin, T. T., Kevin Ford, J., & Blume, B. D. (2017). The state of transfer of training research: Moving toward more consumer-centric inquiry. *Human Resource Development Quarterly*, *28*(1), 17–28. <https://doi.org/10.1002/hrdq.21278>
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191–215. <https://doi.org/10.1037/0033-295X.84.2.191>
- Bandura, A., Freeman, W. H., & Lightsey, R. (1999). Self-efficacy: The exercise of control. *Journal of Cognitive Psychotherapy*, *13*(2), 158–166. <https://doi.org/10.1891/0889-8391.13.2.158>
- Blume, B. D., Ford, J. K., Baldwin, T. T., & Huang, J. L. (2010). Transfer of training: A meta-analytic review. *Journal of Management*, *36*(4), 1065–1105. <https://doi.org/10.1177/0149206309352880>
- Blume, B. D., Ford, J. K., Surface, E. A., & Olenick, J. (2019). A dynamic model of training transfer. *Human Resource Management Review*, *29*(2), 270–283. <https://doi.org/10.1016/j.hrmr.2017.11.004>
- Curado, C., Henriques, P. L., & Ribeiro, S. (2015). Voluntary or mandatory enrollment in training and the motivation to transfer training. *International Journal of Training and Development*, *19*(2), 98–109. <https://doi.org/10.1111/ijtd.12050>
- Elashri, I. I. E. A. F. (2013). The impact of the direct teacher feedback strategy on the EFL secondary stage students' writing performance. <https://files.eric.ed.gov/fulltext/ED540631.pdf>
- Ford, J. K., Baldwin, T. T., & Prasad, J. (2018). Transfer of training: The known and the unknown. *Annual Review of Organizational Psychology and Organizational Behavior*, *5*, 201–225. <https://doi.org/10.1146/annurev-orgpsych-032117-104443>

- Forneris, S. G., & Peden-McAlpine, C. (2007). Evaluation of a reflective learning intervention to improve critical thinking in novice nurses. *Journal of Advanced Nursing*, 57(4), 410–421. <https://doi.org/10.1111/j.1365-2648.2007.04120.x>
- Gegenfurtner, A., Veermans, K., Festner, D., & Gruber, H. (2009). Integrative literature review: Motivation to transfer training: An integrative literature review. *Human Resource Development Review*, 8(3), 403–423. <https://doi.org/10.1177/1534484309335970>
- Gibbs, G. (1981). *Teaching students to learn: A student-centered approach*. Open University Press, Buckingham.
- Gibbs, G., & Simpson, C. (2005). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education*, 1, 3–31. https://eprints.glos.ac.uk/3609/1/LATHE%201.%20Conditions%20Under%20Which%20Assessment%20Supports%20Students'%20Learning%20Gibbs_Simpson.pdf
- Greene, J. A., Bolick, C. M., & Robertson, J. (2010). Fostering historical knowledge and thinking skills using hypermedia learning environments: The role of self-regulated learning. *Computers & Education*, 54(1), 230–243. <https://doi.org/10.1016/j.compedu.2009.08.006>
- Hager, P. (2005). Current theories of workplace learning: A critical assessment. In N. Bascia, A. Cumming, A. Datnow, K. Leithwood & D. Livingstone (Eds.), *International handbook of educational policy* (pp. 829–846). Springer Dordrecht. https://doi.org/10.1007/1-4020-3201-3_44
- Hashemnezhad, H., & Mohammadnejad, S. (2012). A case for direct and indirect feedback: The other side of coin. *English Language Teaching*, 5(3), 230–239. <https://doi.org/10.5539/elt.v5n3p230>
- Hinrichs, A.-C. (2014). Predictors of collateral learning transfer in continuing vocational training. *International Journal for Research in Vocational Education and Training*, 1(1), 35–56. <https://doi.org/10.13152/IJRVET.1.1.3>
- Holen, A. (2000). The PBL group: Self-reflections and feedback for improved learning and growth. *Medical Teacher*, 22(5), 485–488. <https://doi.org/10.1080/01421590050110768>
- Ifenthaler, D. (2020). Determining the effectiveness of prompts for self-regulated learning in problem-solving scenarios. *Journal of Educational Technology & Society*, 15(1), 38–52.
- Islam, T. (2019). Motivation to transfer training in learning organizations. *The Journal of Management Development*, 38(4), 273–287.
- Jamalinesari, A., Rahimi, F., Gowhary, H., & Azizifar, A. (2015). The effects of teacher-written direct vs. indirect feedback on students' writing. *Procedia - Social and Behavioral Sciences*, 192, 116–123. <https://doi.org/10.1016/j.sbspro.2015.06.018>
- Keller, J. M. (2009). *Motivational design for learning and performance: The ARCS model approach*. Springer Science & Business Media.
- Khan, I., Mufti, S., & Nazir, N. A. (2015). Transfer of training: A reorganized review on work environment and motivation to transfer. *International Journal of Management, Knowledge and Learning*, 4(2), 197–219.
- Kim, K. J., Bonk, C. J., Teng, Y. T., Zeng, T., & Oh, E. (2006). Future trends of blended learning in workplace learning settings across different cultures. *Association of Educational Communications and Technology, 29th Annual Proceedings, Dallas, TX, 1*, 176–183. https://members.aect.org/pdf/Proceedings/proceedings06/2006/06_18.pdf
- Kim, S., & McLean, G. N. (2014). The impact of national culture on informal learning in the workplace. *Adult Education Quarterly*, 64(1), 39–59. <https://doi.org/10.1177%2F0741713613504125>

- Lajoie, S. P., Zheng, J., & Li, S. (2018). Examining the role of self-regulation and emotion in clinical reasoning: Implications for developing expertise. *Medical Teacher, 40*(8), 842–844. <https://doi.org/10.1080/0142159x.2018.1484084>
- Lajoie, S. P., Zheng, J., Li, S., Jarrell, A., & Gube, M. (2021). Examining the interplay of affect and self-regulation in the context of clinical reasoning. *Learning and Instruction, 72*. <https://doi.org/10.1016/j.learninstruc.2019.101219>
- Li, J., & Huang, J. (2011). A review of the Ninth International Conference of the Academy of Human Resource Development (Asia Chapter) in Shanghai, China: Workplace learning and sustainable development for individual, organization and society. *Human Resource Development International, 14*(4), 493–502. <https://doi.org/10.1080/13678868.2011.601599>
- Liu, H., Liu, M., & Hariyanto, D. (2020). The current state of the TVET teachers' workplace learning in China. *Journal of Physics: Conference Series, 1446*(1). IOP Publishing. <https://iopscience.iop.org/article/10.1088/1742-6596/1446/1/012034/pdf>
- Loorbach, N., Peters, O., Karreman, J., & Steehouder, M. (2015). Validation of the instructional materials motivation survey (IMMS) in a self-directed instructional setting aimed at working with technology. *British Journal of Educational Technology, 46*(1), 204–218. <https://doi.org/10.1111/bjet.12138>
- Matthews, P. (1999). Workplace learning: Developing an holistic model. *The Learning Organization, 6*(1), 18–29. <https://doi.org/10.1108/09696479910255684>
- Meng-Cheng, Z., & Su, Z. (2015). The problem domain and the development tendency of practice in workplace learning. *Journal of Soochow University (Educational Science Edition)*.
- Pintrich, P. R. (1995). Understanding self-regulated learning. *New Directions for Teaching and Learning, 1995*(63), 3–12. <https://doi.org/10.1002/tl.37219956304>
- Sweet, L., Bass, J., Sidebotham, M., Fenwick, J., & Graham, K. (2019). Developing reflective capacities in midwifery students: Enhancing learning through reflective writing. *Women and Birth, 32*(2), 119–126. <https://doi.org/10.1016/j.wombi.2018.06.004>
- The World Bank. (2022, April 12). The World bank in China Overview. <https://www.worldbank.org/en/country/china/overview>
- van den Boom, G., Paas, F., van Merriënboer, J. J. G., & van Gog, T. (2004). Reflection prompts and tutor feedback in a web-based learning environment: Effects on students' self-regulated learning competence. *Computers in Human Behavior, 20*(4), 551–567. <https://doi.org/10.1016/j.chb.2003.10.001>
- Villena Taranilla, R., Cózar-Gutiérrez, R., González-Calero, J. A., & López Cirugeda, I. (2019). Strolling through a city of the Roman Empire: An analysis of the potential of virtual reality to teach history in Primary Education. *Interactive Learning Environments, 1–11*. <https://doi.org/10.1080/10494820.2019.1674886>
- Wang, J., Tolson, H., Chiang, T. L., & Huang, T. Y. (2010). An exploratory factor analysis of workplace learning, job satisfaction, and organizational commitment in small to midsize enterprises in Taiwan. *Human Resource Development International, 13*(2), 147–163. <https://doi.org/10.1080/13678861003703682>
- Wang, S., Christensen, C., Xu, Y., Cui, W., Tong, R., & Shear, L. (2020). Measuring Chinese middle school students' motivation using the reduced instructional materials motivation survey (RIMMS): A validation study in the adaptive learning setting. *Frontiers in Psychology, 11*:1803. <https://doi.org/10.3389/fpsyg.2020.01803>

- Wang, X., Lin, W., Jiang, Y., Wu, Y., Liu, Y., & Zhou, W. Q. (2021). Active learning and instructor accessibility in online talent training: A field experiment in China during COVID-19. *Development and Learning in Organizations: An International Journal*.
- Wen, M. L. Y., & Lin, D. Y. C. (2014a). How supportive transfer climate affects individual's motivation to training transfer. *International Journal of Learning and Development*, 4(1), 83–97.
- Wen, M. L. Y., & Lin, D. Y. C. (2014b). Trainees' characteristics in training transfer: The relationship among self-efficacy, motivation to learn, motivation to transfer and training transfer. *International Journal of Human Resource Studies*, 4(1), 114–129. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.684.8681&rep=rep1&type=pdf>
- White, C. B., Ross, P. T., & Gruppen, L. D. (2009). Remediating students' failed OSCE performances at one school: The effects of self-assessment, reflection, and feedback. *Academic Medicine*, 84(5), 651–654. <https://doi.org/10.1097/ACM.0b013e31819fb9de>
- Winnie, P. H., & Hadwin, A. F. (1998). Studying as self-regulated learning. In D. J. Hacker & J. Dunlosky (Eds.), *Metacognition in educational theory and practice* (pp. 277–304). Lawrence Erlbaum.
- Winstone, N. E., Nash, R. A., Parker, M., & Rowntree, J. (2017). Supporting learners' agentic engagement with feedback: A systematic review and a taxonomy of recipience processes. *Educational Psychologist*, 52(1), 17–37. <https://doi.org/10.1080/00461520.2016.1207538>
- Yamhill, S., & McLean, G. N. (2001). Theories supporting transfer of training. *Human Resource Development Quarterly*, 12(2), 195–208. <https://doi.org/10.1002/hrdq.7>
- Yan, J., Rothwell, W. J., & Webster, L. (2001). Transferring the soft-skills technology of workplace learning and performance to China. *Performance Improvement*, 40(10), 18–23.
- Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology*, 81(3), 329–339. <https://psycnet.apa.org/doi/10.1037/0022-0663.81.3.329>

Biographical Notes

Xingheng Wang is the Head of the Field Training and Development Department at Novartis Pharmaceuticals (China). His research interests are self-regulated learning, deep learning strategies, learning transfer, learning measurement, competency modeling, and performance-based training assessment in workplace learning with a focus on China.

Weihan Lin is the Head of the Digital Learning Center of the Field Training and Development Department at Novartis Pharmaceuticals (China). His research interests are learning analytics, online learning strategies and technologies, learning engagement, learning transfer, and performance-based training assessment in workplace learning.

Tianwen Xue is Vice President and BU Head of strategic brand of Zhejiang Haisen Pharmaceutical. He has been worked in Novartis Pharmaceuticals (China) business unit national sales director in charge of field sales management. His research interests are mainly focused on the application of learning transfer areas.

Adam Green is Doctoral Candidate in the Applied Experimental Psychology program of Southern Illinois University Carbondale, his research interests include business ethics, moral psychology, and information communication.

Limin Gu is the Business Unit's Sales Training Leader at Novartis Pharmaceuticals (China). Her research interests are in performance-based training assessment, instructional design, learning engagement, and learning transfer in workplace learning, with a focus on China.

Yansheng He is the Senior Field Training and Development Manager at Novartis Pharmaceuticals (China). His research interests include instructional design, design-based learning, instructional strategies, learning engagement, and learning transfer in workplace learning, with a particular emphasis on China.

Xiaoshan Huang is a PhD student in the Department of Educational and Counselling Psychology (ECP) at McGill University, and a member of the ATLAS (Advanced Technologies for Learning in Authentic Settings) Lab. Her areas of research interests include investigating learners' self-regulated learning, motivation, and epistemic emotions in both academia and the workplace, as well as socially shared regulation in collaborative learning.

Zilu Jin is the project support of the Online Small Meeting project from Shanghai Delightgo Internet Technology Co., Ltd. Her areas of interest in research include training measurement and evaluation, learning engagement, data analysis, learning-oriented assessment, and training transfer, with an emphasis on China.

Yihua Wu is the Project Manager from Shanghai Delightgo Internet Technology Co., Ltd. His research interests include learners' self-regulated learning, learning engagement, training measurement & evaluation, learning oriented assessment and training transfer, organizational behavior, IRT Theory, Computer-Adaptive Testing.