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Advancing the dual learning system in Kazakhstan: Perspectives of agri-business sector employers

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Abstract

The dual learning system gained prominence as part of the education system in Kazakhstan, involving training students in close collaboration with businesses to equip them with the skills and expertise needed for a modern workforce. This study contributes to existing literature examining the adoption and implementation of German-originated training practices in developing countries using an empirical evaluation of the performance of the dual learning system and traditional education in the Kazakhstani agri-food business sector based on perceptions of businesses, their attitudes and motivation for participation. A qualitative methodology based on the Expectancy Theory of Motivation was utilized by implementing Focus Group Discussions with employers of 19 businesses of different sizes. Results showed that while certain businesses implementing dual learning excel in attracting skilled professionals, most employers highlight hesitance among younger individuals to pursue careers in the agri-food sector. Small businesses mainly encounter difficulties in effectively communicating the benefits of working in the sector, coping with high costs, and

grappling with uncertainties surrounding the retention of graduates. Managerial and policy recommendations from the study include incentivizing businesses for data sharing on the implementation of dual learning, facilitating graduate retention support and standardizing training conditions.

INTRODUCTION

Significant changes in occupational structures and youth unemployment levels prompt a global debate on the role of vocational education and training (VET) in boosting youth employment in the labour market (Valiente & Scandurra, 2017). Countries adopting the German-originated dual learning system (DLS) showcase robust economic performance and minimal youth unemployment, prompting calls for VET system reforms (Fontdevila et al., 2022). This training approach combines on-the-job training with part-time academic education that effectively prepares students for future careers. In response to positive experiences, many Governments have introduced dual learning programmes in their national contexts to enhance the employability of young people and provide a smooth transition from school to work (Lewis, 2007).

Transferring international best practices to local settings, however, could be challenging (Li & Pilz, 2023). Successfully implementing DLS schemes necessitates understanding their interaction with broader social and economic contexts and the reactions of involved parties (students, educational institutions and businesses) (Davoine & Deitmer, 2020). While proven effective in developed countries, DLS faces challenges and criticisms in developing nations, including concerns about access inequality, financial constraints, operational issues and limited higher education opportunities (Valiente & Scandurra, 2017). Addressing these issues requires a holistic approach tailored to each specific country and the unique circumstances and needs of their industries (Davoine & Deitmer, 2020, p. 140).

In 2012, Kazakhstan introduced the German-originated training practice to its national technical and vocational education (TVE)[1] system to address youth unemployment and align education with labour market needs (Mukhamadeyeva, 2016). This shift towards a new approach has prompted educational institutions to revise programmes, emphasizing work-based training with practical hours increased to 60% of curricular programmes[2] (Doskeyeva et al., 2024, p. 4). This has led to businesses becoming stakeholders directly participating in the educational process. The implementation of DLS in Kazakhstan addresses the gap between traditional education and business needs, resulting in employment challenges for graduates due to a skills mismatch, leading to increased youth unemployment and training costs for businesses (Kocsis & Pusztai, 2021; Vogelsang et al., 2022) More specifically, other research suggests that investment (or involvement) in DLS will lead to reducing employee turnover rates

[1]Both VET and TVE are similar education system that focus on providing vocational skills. The specific terminology and structures may differ based on the country or educational context.

[2]It is 20% more than the practical hours allocated in traditional approach.

within the organization and a positive impact on employee retention or recruitment of professionals (Das, 2013; Gyepi-Garbrah et al., 2023, p. 3; Muehlemann & Wolter, 2020; Muhambetaliev, 2016, p. 2).

The Government has formalized DLS status in legislation, providing operational guidelines for all parties involved (Muhambetaliev, 2016). The National Qualification Standards (NQS)[3] have started shaping the knowledge and skills required by professionals as specified by businesses employers (Kenzhegaliyeva, 2018, p. 82). Kazakhstani businesses typically offer short-term ad hoc/traditional training (coined as 'non-dual' businesses in this study). In contrast, 'dual' businesses, as defined in this study, exclusively engage in DLS, guided by established agreements and rules, collaborating closely with educational institutions, and having direct involvement in training, making graduates meet the labour market needs (Doskeyeva et al., 2024, p. 1). This effort considers investing in the DLS organization and is seen by businesses as an investment in human capital (Lewis, 2015).

Studies examining DLS in Kazakhstan highlighted both challenges as well as progress in implementing the system (Kenzhegaliyeva, 2018) at the leading universities (Tastanbekova et al., 2021) and vocational schools in Kazakhstan (Doskeyeva et al., 2024). Earlier studies showed that DLS facilitates the development of systemic ideas and creative skills in students (Alshynbayeva et al., 2016), and public-private partnerships increase their level of preparation (Issayeva et al., 2017). However, there is a lack of studies addressing the perceptions of the Kazakhstani business community regarding the operation of DLS. Successful apprenticeships rely on close collaboration and communication between three main involved parties: businesses, educational institutions, and students (Chankseliani & Anuar, 2019). Thus, employers could provide essential feedback to governmental bodies to ensure the effective organization of DLS, as well as its quality and expected results. This makes it imperative to thoroughly investigate the genuine motivations of businesses participating in this system and the benefits they expect to accrue from this engagement.

Given this backdrop, the study reported here sought to explore the perspectives of businesses on their motivations for participating in the DLS and to assess the advantages, specifically in terms of the perceived costs associated with the organization of DLS and reduction in employee turnover, that businesses gain through DLS engagement relative to non-dual practices, such as ad hoc/traditional training. Specifically, this study aimed to seek answers to the following research questions:

- RQ1. What are the reasons for conducting training and benefits derived from the DLS compared to ad hoc/traditional training?
- RQ2. Do participating businesses consider the expense incurred in organizing DLS higher than that from ad hoc/traditional training?
- RQ3. Have businesses experienced a reduction in staff turnover and improved graduate recruitment since becoming involved in DLS?

Emphasis will be placed on the agri-food industry since this sector has an acute shortage of qualified personnel (Kenzhin et al., 2016). The agri-food industry in Kazakhstan is characterized by the post-Soviet political landscape that prompted a transformation in the agrarian structure, marked by a shift from large-scale, knowledge-intensive mechanized

[3]597 professional standards have been approved by 2023, which is only a quarter of all types of occupations.

farming to two types of farming, one characterized by modernized intensified production systems as before (Abraliyev et al., 2023) and another consisting of household-based farming systems with predominantly manual cultivation on smaller plots resulting from de-collectivization (Toleubayev et al., 2010). This led to a high demand for medium and low-skilled occupations (e.g., tractor drivers) as well as individuals with professional farming experience (agronomists, veterinarians, and agricultural engineers).

This study focuses on the Akmola region, which is one of the leading agro-industrial regions of Kazakhstan that remains in demand for professionals (Nurtayeva, 2022). Research has highlighted the uncontrolled migration of young people from rural areas to cities, which affects the growth of youth unemployment (Kenzhin et al., 2016). Additionally, the monitoring of DLS in different industries in Kazakhstan was done selectively, bypassing the agri-food sector, which makes it challenging to evaluate its usefulness fully (Doskaliyeva et al., 2018).

Previous studies have predominantly focused on understanding employee motivations across sectors (Lee, 2020) and various aspects of apprenticeship evaluation, such as skill development (Brinia et al., 2018), employment prospects (Lassnigg & Vogtenhuber, 2011), and pedagogical outcomes (Bishop, 2017), rather than the experience of employers participating in DLS (Rowe et al., 2017, p. 190). This study contributes to existing research by exploring the performance of implementing a German-originated training model in diverse educational systems within a developing economy context, particularly in the agri-food industry and from the perspective of businesses. It is the first study to analyse primary data from agri-food businesses involved in DLS in Kazakhstan. Understanding the reasons and motivations (or benefits) for conducting training under the DLS can provide insights into the challenges that agri-food businesses encounter when implementing DLS. This study uses The Expectancy Theory of Motivation (Vroom et al., 2005) as the underlying conceptual framework for conducting qualitative research to understand specific motivational forces in the agri-food industry, depicting the decision-making processes managers undergo to determine their engagement in training activities.

LITERATURE REVIEW

Dual and non-dual approaches to training

The DLS was first introduced in the TVE system of Kazakhstan in 2012 which is a secondary vocational education system used in educational institutions (colleges), corresponding to levels 3 and 4 of the International Standard Classification of Education (Doskeyeva et al., 2024, p. 2). The elements of dual learning were later incorporated into university curricula by increasing the hours allotted to practice (Issayeva et al., 2017, p. 454). A critical difference between DLS and ad hoc/traditional training is the collaborative effort in training between businesses and educational institutions, leading to work-based learning with increased practical hours (up to 60%) (Doskeyeva et al., 2024, p. 4). This system actively involves employers in shaping the curriculum, providing practical training, and ensuring that students acquire industry-relevant skills (Tastanbekova et al., 2021, p. 186), thus requiring more responsibilities and investment from businesses. Table 1 describes further distinguishing characteristics of dual and non-dual businesses.

DLS provides a more immersive learning environment that mirrors industry conditions (Davoine & Deitmer, 2020, p. 136). Unlike non-dual experiences, practice in dual learning is

TABLE 1 Distinguishing characteristics of dual and non-dual businesses (identified from the literature).

		Non-dual	
	Dual	**Traditional education**	**Ad hoc training**
Provided training structure and duration	A formal form of education that integrates classroom education with practical training directly within a workplace environment, with extended practical hours (up to 60% of the curriculum). It involves systematic and longer-term commitment with a maximum of 3 years and a minimum of 2 years.	A classroom-based approach with subsequent short-term practical training is a part of formal education spanning 1–3 months, depending on the type of professional practice (educational, industrial, and pre-graduate), and could involve 20%–40% of study hours.	Informal and nonsystematic, aimed at personal development to acquire new or modified professional skills necessary to perform a specific type of work. Responds to immediate needs without a predefined plan or curriculum. Often occurs on a short-term or as-needed basis (several hours or several months).
Partnerships and responsibilities	Establishes strong collaborations between educational institutions and is equally responsible for training quality and content. Facilitates the consolidation of theoretical knowledge into practice by providing opportunities for immediate application in a workplace, employment during practice and compensation.	Relies on partnerships with educational institutions with limited training responsibilities and aims to provide its best practices in a particular period, according to the curriculum. Usually, due to the short training period, they do not employ interns during their practice.	Less collaboration with educational institutions could be conducted directly at the employer, educational institutions, and other organizations that provide professional training, retraining, and advanced personnel training. This often focuses on immediate, specific needs within the enterprise without a broader industry-wide perspective.
Involvement	Directly participates in developing content, working curricula, educational and methodological complexes, and organizing training. Provides mentor support and invests in organizational settings. They are more interested in training since they train staff for themselves. Students are certified by the involvement of mentors and specialists from the businesses.	Limited direct involvement in educational processes. Students mostly follow curriculum and working programmes designed and approved by educational institutions. Examinations and results on practice are carried out only by educational institutions.	Do not be involved in the training process, but choose the forms, content, and training volume.
Qualification	Provides recognized qualifications and practice hours counted as work experience.	Provides recognized qualifications, but practice hours do not count as work experience.	Do not lead formal qualifications.

much more extensive in duration and leads to recognized work experiences for graduates. At the beginning of the first year of study, learners express their intentions to enrol in the DLS through a three-party agreement with the college and the training company. Selection for dual training is carried out based on the results of interviews with students who have expressed a desire to study in DLS conducted by the businesses (Rules for the organisation of dual training, 2016). For businesses intending to participate in the DLS, the process includes expressing their intentions by applying to the NCE, subsequently establishing partnerships with educational institutions, and following guidelines for organizing dual learning in the workplace (Doskaliyeva et al., 2018).

DLS is presented to businesses as a strategic method for optimizing personnel training, allowing employers to custom-tailor the qualifications of learners to align with their specific organizational requirements (Kenzhegaliyeva, 2018, p. 80). This approach is intended to yield business cost savings by mitigating expenses associated with personnel recruitment, training, and retraining efforts. As an incentive to foster corporate participation in the DLS, the state subsidizes teaching hours for mentors engaged by enterprises (Tastanbekova et al., 2021, p. 181). Furthermore, the Government is actively executing projects designed to address youth unemployment, providing employers with ancillary benefits (Doskeyeva et al., 2024, p. 4). However, it is noteworthy that these initiatives primarily focus on creating temporary employment opportunities without ensuring sustained employment of specialists beyond the cessation of state subsidies.

Benefits and challenges of dual learning implementation and adoption critiques

Businesses see DLS organizations as a strategic investment in their human resources, bringing direct and indirect economic and social benefits (Crépon & Premand, 2018; P. Lewis, 2015). Apart from heightened productivity, employers gain from reduced turnover, increased retention rates, acquisition of skilled employees, and lower retraining costs (Muehlemann & Wolter, 2014, p. 5). Research on work-based learning highlights advantages that justify the investment. For example, Pogatsnik (2018) conducted interviews on dual training in engineering education in Hungary, finding that it enhances workforce quality, reduces hiring costs, and improves recruitment efficiency. Smyth and Zimba (2019) revealed that the advantages of the apprenticeship programme outweighed the associated costs. Crépon and Premand (2018) explored the indirect impacts of apprenticeship programmes, showing they enhance the net value of the company.

While apprenticeships offer numerous potential benefits, businesses often encounter challenges when engaging with this training system. Chankseliani and Anuar (2019) across 10 study countries found that many companies perceive apprenticeships as costly, complex, and risky investments despite the advantages. Sauli et al. (2021) conducted focus groups with in-company trainers to examine their points of view on the Swiss vocational programme and identified weak collaboration between schools and training firms. Additional studies by Howe et al. (2023), Mulkeen et al. (2019) and Rowe et al. (2017) underscore various critical challenges faced by employers in apprenticeship programmes, encompassing low completion rates, retention issues, mentor training, logistical concerns, and other issues related to the education system and training providers.

Adapting models developed in other countries, such as the German-originated DLS, can be successful only when the cultural characteristics and conditions are considered under which they were created (Lewis, 2007). Li and Pilz (2023) emphasize that the outcomes of VET system transfers could be uncertain due to the diverse and dynamic framework conditions in different countries, encompassing economic development, the education system, labour market structure and socio-cultural context. Many factors contribute to adaptation failure, including firm size, industry, type of work environment, economic cycle, Government incentives, and other social-institutional elements (Valiente & Scandurra, 2017). Researchers also emphasize that success often depends on the synergistic interaction of various elements at both micro (e.g., within a company) and system levels (Davoine & Deitmer, 2020). Hence, examining the performance of imported apprenticeship programmes is essential in considering the distinct educational frameworks and labour market regulations of each study country.

Resource constraints (Smith et al., 2019), operational inconsistencies coherence (Fontdevila et al., 2022), institutional coordination issues (Hernández-Lara et al., 2019), and inadequate workplace learning supervision (Jjuuko et al., 2021) contribute to variations in training quality, undermining programme performance. Key concerns in apprenticeship programmes in developing nations encompass the economic constraints that: limit resource allocation for these programs; provide unequal access to education and training opportunities (Pilz & Regel, 2021, p. 117); and increase hesitancy from industries to engage (Vogelsang et al., 2022). Additionally, developing countries often lack the capacity for systematic data collection and analysis, which makes it challenging to assess the outcomes of these programs (Valiente & Scandurra, 2017).

Investment intentions of businesses

Becker (1962) argues that employers invest in human capital to make a profit in the future and that education and training are investments in future productivity. Although human capital theory (HCT) did not consider apprenticeship (in our case, DLS), it was often seen as an investment in human capital and a catalyst for new theoretical concepts (Lewis, 2015). The theoretical importance of HCT was the distinction between investment in general and specific training (Becker, 1962). General training imparts skills transferable to various workplaces, yet businesses prefer providing it without incurring costs. Workers might be paid less during general training than their current productivity. Conversely, specific training solely benefits the training firm. If a graduate leaves, the investments of the firm are at risk. To mitigate this, businesses may be inclined to share the expenses of specific training to recover their investments in specific skills, particularly in employee-initiated departures (Acemoglu & Pischke, 1999).

Researchers have developed new models and reconsiderations of the human capital theory that explain why firms are willing to invest in general skills that would benefit other firms in addition to themselves. Several studies delineate potential reasons for the participation of businesses in apprenticeship programs or investing in training, such as pay compression (Bassanini & Brunello, 2008), market competition (Heywood et al., 2019) and high recruitment costs (Muehlemann & Wolter, 2014).

The Theory of Planned Behaviour (TPB) (Ajzen, 1991), the Theory of Participation (TP) (Dreze, 1976), and the Social Exchange Theory (SET) (Cook et al., 2013) presented elements that might elucidate specific aspects of decisions made by businesses to participate in

apprenticeship programs. However, none of them offered a foundation for understanding the motivations behind decisions to invest. Despite the well-known constraints of subjective norms within the TPB, which denote the influence of others on an individual's behaviour, they may not significantly impact investment intentions (Yulandreano & Rita, 2023). SET focuses on the exchange of resources between individuals and organizations. However, it may not fully capture the complexity of human relationships and motivations (Smyth & Zimba, 2019, p. 95). The TP primarily also focuses on stakeholder and public engagement and does not specifically address investment motivations (Reed et al., 2018).

In DLS, skills for agri-food industry positions align with the national curriculum and adhere to NQS, which employer associations collaboratively develop and encompass qualifications, competence, content, quality, and working conditions (Kenzhegaliyeva, 2018, p. 82). Therefore, they can be shared with many businesses and are more general than specific in nature (Muehlemann & Wolter, 2020). The traditional approach also imparts transferable general skills, enabling students to succeed in diverse domains, while DLS goes beyond basic skills (literacy and numeracy) by providing job-related education (Jackson et al., 2019). Given that DLS facilitates the acquisition of general skills, it is crucial to comprehend the motivations that drive businesses to engage in DLS. While the reviewed theories above might provide some understanding of the varied intentions behind investments of businesses, they did not provide a foundation towards understanding the motivations or process in decision-making.

Methodological and conceptual background

Performance apprenticeship assessment is a multifaceted process that extends across different levels and involves various methods, encompassing a network of involved parties such as learners, businesses, and educational institutions (Fretwell, 2003). Figure 1 illustrates the Work-based model (WBL) of Edmunds (2007) with the involvement zones of three parties and assumes that an industrial employer generates knowledge and provides training, making them one of the key players in vocational education.

The evaluation of training performance resulting from the direct engagement of businesses might be conducted most effectively when viewed through their lens (Rowe et al., 2017). Bajgar and Criscuolo (2016) introduced a framework aimed at enhancing comprehension of education and training outcomes, where 'evaluation of the impact on employers' stands out as one of the independent components of the assessment framework. Assessment methods can vary significantly based on whether the evaluation is focused on internal or external outcomes, with the choice of a specific methodology playing a crucial role in this variation (Fretwell, 2003, p. 184).

This study uses the Expectancy Motivation theory of Vroom et al. (2005) as a conceptual background to understand the motivation of businesses and associated expectations that made them engage in DLS. Figure 2 illustrates how the Expectancy theory comprises three essential motivational beliefs: expectancy, instrumentality, and valence (Lee, 2007). Expectancy involves the conviction that the effort of an individual will lead to the achievement of the desired benefits (Chopra, 2019). Instrumentality is the belief that receiving a reward is contingent upon meeting performance expectations (Gyepi-Garbrah et al., 2023). Valence represents the value an individual assigns to rewards based on their individual requirements, objectives, principles, and motivation (Chopra, 2019, p. 308).

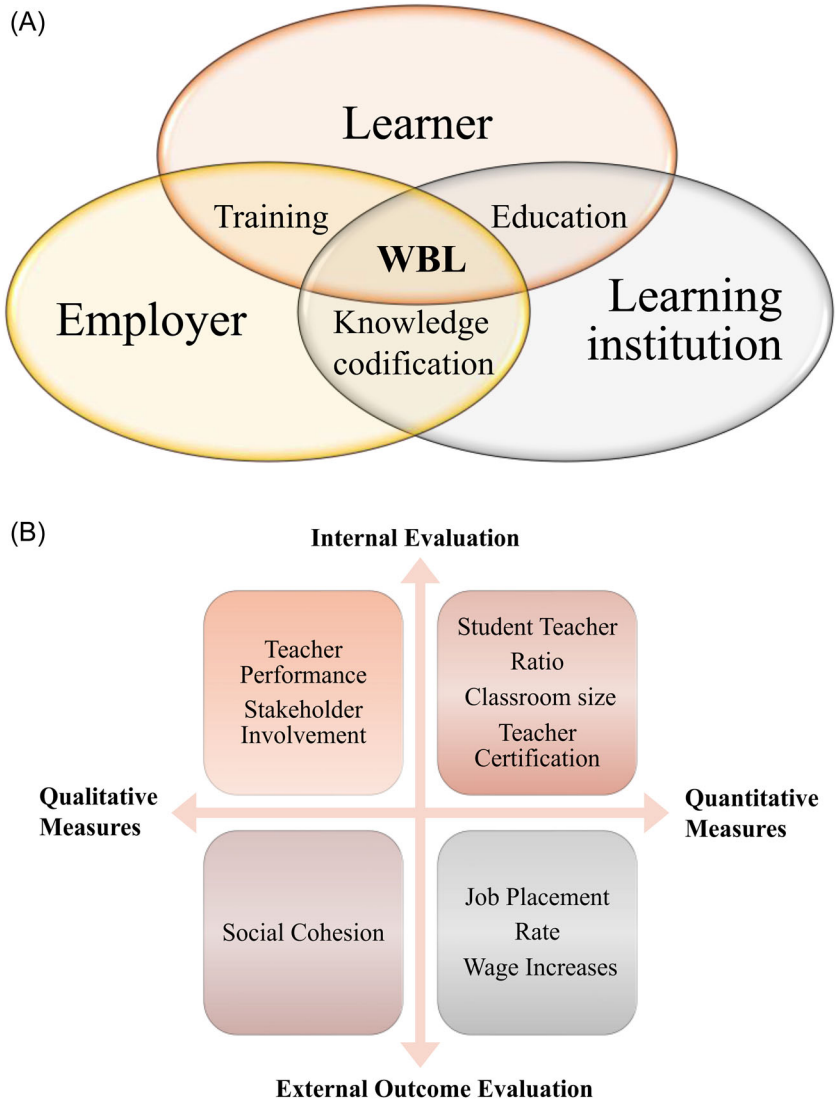

FIGURE 1 (a) Work-based model (Edmunds, 2007) and (b) evaluation measures (Fretwell, 2003). [Color figure can be viewed at wileyonlinelibrary.com]

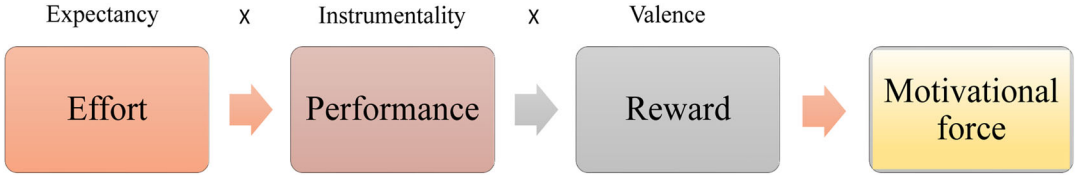

FIGURE 2 Expectancy Motivation Theory (Vroom et al., 2005). [Color figure can be viewed at wileyonlinelibrary.com]

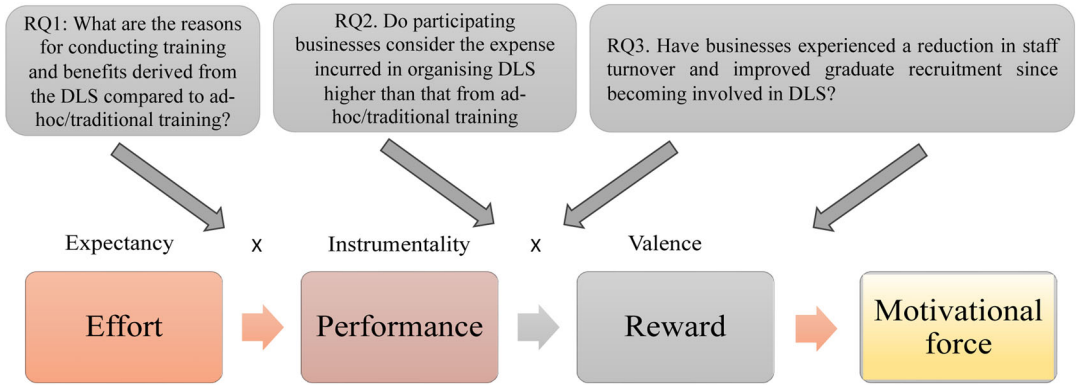

FIGURE 3 Practical implementation of the conceptual framework with research questions (Vroom et al., 2005). [Color figure can be viewed at wileyonlinelibrary.com]

This concept can be applied to the motivations of DLS businesses. For instance, managers dedicated to enhancing the quality of their human capital through continuous training, such as engaging in DLS, can anticipate heightened competitiveness and reduced challenges in recruiting high-quality staff (Expectancy). Once businesses provide quality training by investing in the organization of DLS at the workplace and providing essential equipment and supplies, they can anticipate a range of rewards. These may include heightened productivity, decreased employee turnover, reduced expenses associated with retraining and recruiting professional staff, and other benefits of maintaining a qualified workforce (Instrumentality). Finally, if managers confirm that the reward is worth their effort, they are further motivated to engage in the DLS by dedicating their investments (Valance). Since this study seeks to understand the motivations of businesses to opt for DLS over the traditional training approach, this framework is applied to businesses adopting DLS only.

Figure 3 illustrates the practical implementation of the conceptual framework through the formulation of the research questions. To understand what motivation drives businesses to put effort into DLS, the first research question highlights the main reasons managers conduct training and what benefits they expect from involvement in DLS (RQ1). Concerning the potential rewards of involvement in DLS, this study examines whether managers perceive DLS as a relatively less expensive method of sourcing qualified personnel (RQ2). Reducing employee turnover and hiring professionals may indicate how businesses value the positive outcomes of training investments and motivate engagement in DLS (RQ3). Exploring the motivations for adopting DLS by examining its perceived advantages will provide insights into the overall benefit of DLS as a strategic approach to hiring qualified professionals.

MATERIALS AND METHODS

This study used a cross-sectional design, conducting semi-structured Focus Group Discussions (FGDs) with two participant types in each group: dual and non-dual agri-food businesses of different sizes (Krueger & Casey, 2015). Researchers (Howe et al., 2023; Rowe et al., 2017; Smyth & Zimba, 2019) have found this method valuable for in-depth exploration of work-based programme performance, including programme outcomes and employer perspectives on

industry-related recruitment and retention challenges. The focus group discussions were designed to serve this theoretical framework but also included questions structured to elicit qualitative information on the impressions of dual and non-dual employers, with the purpose of gaining an understanding of the differences in their perspectives on both approaches to training.

Eligible dual businesses were obtained from the published data list of businesses participating in the DLS registered under the National Chamber of Entrepreneurs (NCE) of Kazakhstan (NCE, n.d.). Selection of non-dual businesses was organized with the help of colleges and universities, which had agreements with businesses providing ad hoc/traditional training.

This research focused on 120 dual and 1999 non-dual agri-food businesses based on a database in the Akmola region (NCE, n.d.). Since DLS was introduced in 2012 and businesses can be involved at any time, we were interested in businesses that had provided training for a minimum of 3 years, excluding those without contracts with educational institutions and training fewer than five students annually. A random sampling technique was adopted for small-to-large-sized businesses that met the main criteria above to avoid biases during the study. Representatives of the NCE and the education institutions conducted this part of the selection process.

Fifty-three official letters were distributed to potential businesses inviting them to FGDs; 19 businesses responded positively. Questions were targeted to those in high-ranking managerial positions familiar with or involved in implementing dual and ad hoc/traditional training, understanding the training costs, benefits, and limitations, and being aware of the staff turnover ratio.

A total of 11 dual and 8 non-dual interviewees from businesses working with colleges (9 businesses) and universities (10 businesses) participated. Businesses were participating in various agri-food activities, including cereals and crops production, bread production, veterinary medicine, poultry meat processing and preservation, fertilizer production, and cattle and horse breeding. To facilitate better alignment and interpretation of results, Figure 4 illustrates how focus groups were divided into businesses working with colleges (FG1 and FG3) and businesses working with universities (FG2). In terms of the size of the participating businesses, two large, six medium, and eleven small businesses were interviewed. Information on the size[4] of businesses is taken from KazDATA (n.d.).

Three FGDs were conducted on different days each. FG1 and FG2 were held in the conference room of S. Seifullin Kazakh Agrotechnical Research University, Astana city. Since some business representatives experienced difficulties travelling to the city, FG3 was conducted on a farm based in Enbek village, Akkol district, Akmola region. The number of participants in each group was: FG1—7 participants (5 dual, 2 non-dual), FG2—10 participants (5 dual, 5 non-dual) and FG3—2 participants (1 dual, 1 non-dual) (Figure 4). The duration of participation was 2 h for each group. To minimize group dynamics, the moderator encouraged open and inclusive communication among every participant to mitigate conflicts and promote constructive dialogue by allowing everyone to express their opinions.

Questions for FGDs were semi-structured and included key questions regarding the benefits businesses have from providing training, changes in employment turnover, whether the costs of

[4]Entrepreneur Code of the Republic of Kazakhstan (2015) classifies businesses based on employee numbers: large (more than 251 employees), medium (51–250 employees), and small (up to 50 employees).

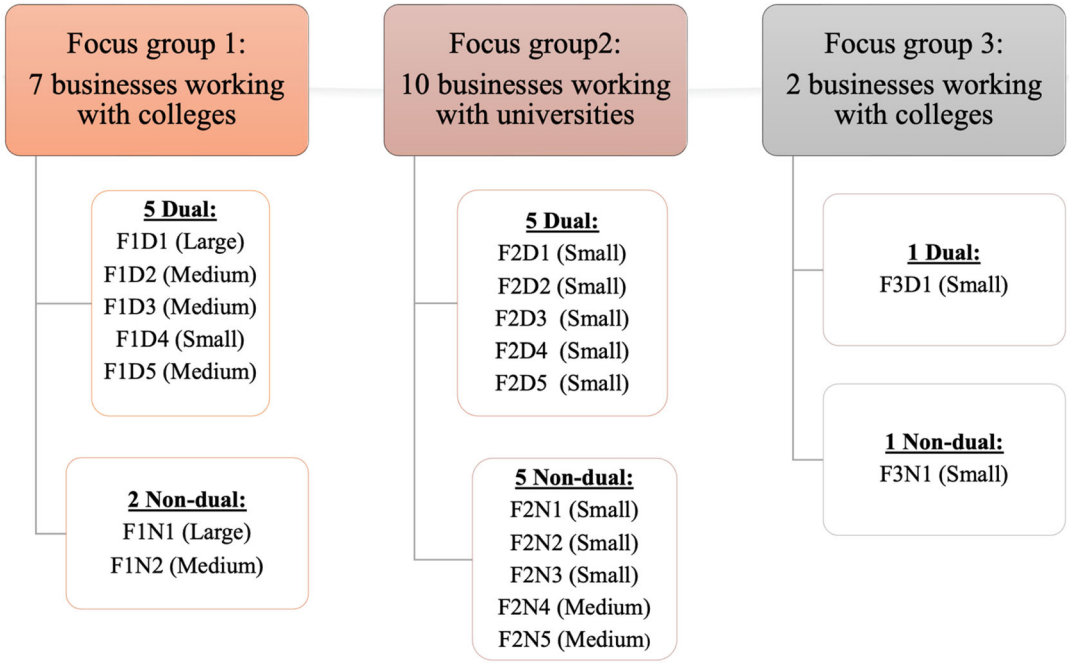

FIGURE 4 Focus group distribution (Authors' design). [Color figure can be viewed at wileyonlinelibrary.com]

organizing training are justified and whether they are satisfied with the quality of training of graduates. Respondents were given a study reference number to protect their identity. All FGDs were audio-recorded. The responses of each participant were carefully analysed and coded using the NVivo 12 tool (Dhakal, 2022). Figure 5 demonstrates how results were sorted into dual and non-dual categories as part of the interview processing and generated into separate groups. The Comparative Chart (Figure 5) was created to compare the dual and non-dual categories, discern common indicators among the groups, and pinpoint distinctive items. Leveraging the 'Expand' feature allowed us to delve deeper into each response of respondents for a more thorough examination.

Ethical approval was granted by the School of Agriculture, Policy, and Development Ethics Committee, University of Reading, UK, on 14 July 2022, with reference number 001922.

RESULTS AND DISCUSSION

Reasons for conducting training and benefits derived from the DLS and ad hoc/traditional training

Taking into account the 'Effort' concept in the Expectancy Theory, both dual and non-dual groups believe their training investment will develop personnel. Efforts of businesses towards investment in DLS are explained by qualified staff tailored to the specific needs of the company, which in turn may save costs on finding and selecting employees, their retraining, and the

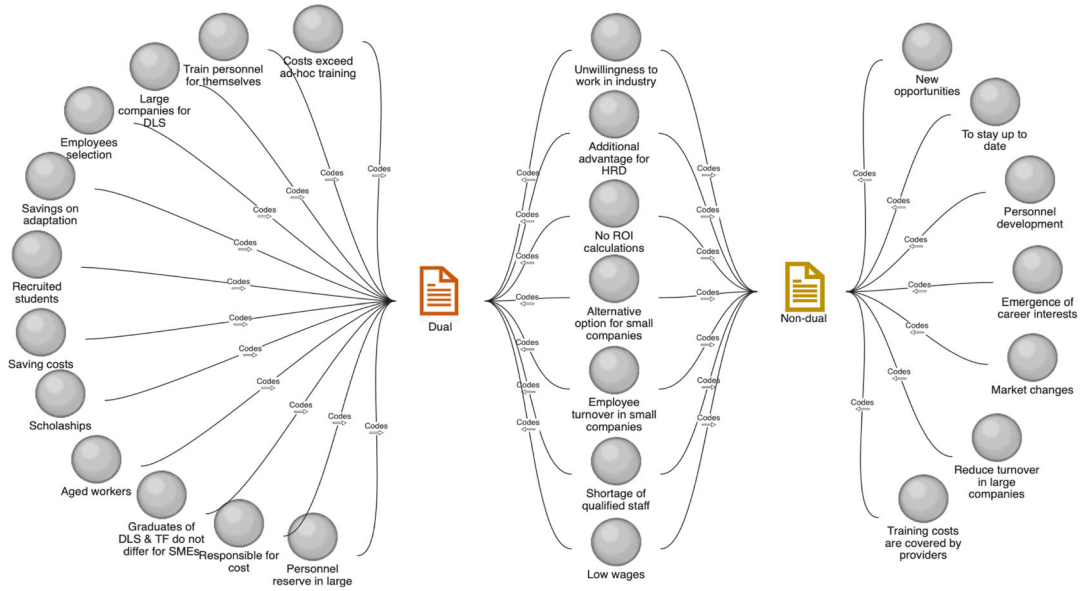

FIGURE 5 NVivo comparative chart (Authors' design). [Color figure can be viewed at wileyonlinelibrary.com]

adaptation process. Examining the primary motivation for investing in DLS reveals underlying reasons for this motivation and underscores specific challenges within the agri-food sector.

A shortage of professionals available to hire was identified as the main reason dual and non-dual businesses need to provide training. According to dual businesses, a lack of qualified personnel is mainly caused by the *inconsistency* between the educational institutions and market demands. F1D5 stated:

> ...we believe that the knowledge given in colleges and universities does not correspond to what business expects. Therefore, the reasons for our participation in DLS are that we are personally interested in training qualified personnel in the field of mechatronics in agriculture in three areas: mechanics, electronics, and information technology...

Study findings, however, indicate another reason (Diagram 1 illustrates additional reasons for personnel shortage identified in the study) for the shortage of qualified specialists in the agri-food sector—the *ageing of staff* because of the unwillingness of young people to work in this sector:

> We will need more personnel in the next 5-10 years because many workers are over 50 now. Moreover, there is no replacement for them, and young people are not willing to take these positions (F3D1).

This is a reason for the depletion of new labour resources and an increase in the number of pensioners representing agri-food labour resources (Nurzhanova et al., 2020). Despite the clear need for human resources in agriculture, businesses mentioned *a low salary rate*, which could

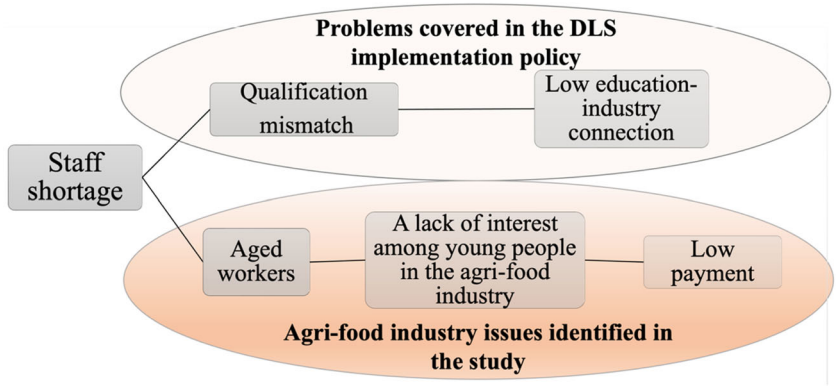

DIAGRAM 1 Identified reasons for the shortage of qualified staff (Authors' design). [Color figure can be viewed at wileyonlinelibrary.com]

be one of the reasons young people avoid working in this industry. For instance, F2N2 company stated:

> Today, salary is one of the most critical factors. Our starting pay rate is 100 thousand[5] tenge for people who come to us to work as laboratory assistants...The youth are willing to work with us but are leaving because we cannot offer them a decent salary...

According to the report on the labour market (Enbek, 2022), veterinary and agriculture workers receive the lowest wages—161.9–167.3 thousand KZT per month (approximately 350 EUR[5] per month), resulting in the flow of workers into the higher-paid service sector.

Almost all businesses believe that DLS will bring them an influx of new young employees. Non-dual businesses emphasize the development of personnel and the emergence of career interest (N1D1), while dual businesses (e.g., F1D2, F3D1, F1D5) note that the main advantage of participating in DLS for a company is the opportunity to train personnel for themselves, saving on the costs of finding and selecting employees, their retraining and adaptation:

> Training shows us who will be good employees and stay in the company. Selection is already underway. Hiring someone from outside is risky. This is where we prepare our staff for ourselves.

These results are consistent with Pogatsnik (2018, p. 146), Lewis (2015) and Jansen et al. (2015), stating that apprenticeship programmes empower employers to tailor curriculum content to meet specific professional demands, thereby bridging the theory–practice gap, facilitating saving costs and smoother job transitions. Additionally, evidence indicates that graduates of such apprenticeship programs typically experience enhanced labour market prospects, including shortened job search durations and increased employer retention rates postgraduation (Muehlemann & Wolter, 2020).

[5]1 KZT = 0.00199 EUR (National Bank of Kazakhstan, n.d.).

Analysis of the primary motivation for investing in DLS reveals various underlying reasons beyond qualification mismatch, highlighting specific challenges within the agri-food sector. Earlier studies highlighted that ineffective communication between establishments underscores the potential mismatch between educational requirements and labour market demands (Lalioti, 2019; Sauli et al., 2021). Ageing of staff problem is also mentioned by Toleubayev et al. (2010, p. 368), underlining the diminished interest in agricultural work among rural youth, compounded by a shortage of specialists in the agri-food industry, which stands out as a significant concern. Low wages might have contributed to the lack of interest in pursuing careers in agriculture, leading to an ageing workforce (Alpysbaev et al., 2023). Understanding the engagement of young individuals in farming requires consideration of factors such as individual motivation, aspirations, and perceptions (Consentino et al., 2023). Lack of awareness about employment opportunities in agriculture and the need for a revised career advice curriculum might have affected the decisions of students (Roy, 2023). Training satisfaction is found to be an important dimension influencing the intention to remain within the trained occupation (Liu, 2021). Moreover, perceived organizational support, encompassing factors like payment, recognition, and employer support, plays a significant role in retention within the trained industry (Forster-Heinzer et al., 2016). To comprehensively understand and discern the hesitancy of young individuals to work in their specialized fields, identifying factors influencing their career intentions in the agri-food industry is essential.

Perception of employers of the businesses regarding costs associated with DLS compared to non-dual training

Investing in DLS is motivated by the expectation of businesses that the knowledge and effort put into providing training will be recognized and rewarded (Lewis, 2015). In the context of costs incurred, the 'Instrumentality' of Expectancy theory involves the expectations of managers about financial resources invested in the programme, and this return is anticipated to come from hiring skilled professionals (Jansen et al., 2015). Results show that businesses perceive costs incurred in organizing DLS to be relatively higher than ad hoc/traditional training (Table 2). Dual businesses mentioned wage payments of hired students for seasonal work in fields (F1D3), farms (F3D1) and veterinary clinics (F2D2, F2D3), which increases costs for DLS training. Muehlemann and Wolter (2020) and Asghar et al. (2016) also highlighted that businesses providing training invest in the general human capital of apprentices in addition to paying them a wage, which increases the overall cost for the businesses. Dual businesses also mentioned investing in infrastructure to organize DLS training. Identified cost categories for DLS match those observed in earlier studies. For example, providing or purchasing equipment, devices, and consumables for students at the workplace and allocating training places and facilities are cost elements incurred in DLS training (Asghar et al., 2016, p. 77). Other expenses linked to creating training resources, exam arrangements, curriculum design, providing supervision support and contract arrangements are also taken care of by businesses in DLS (Mukhamadeyeva, 2016, p. 3). Nevertheless, the Government repays mentoring expenses for dual businesses to encourage involvement, and they still face costs throughout the training phase when their productivity is reduced due to instructing students, which is not common for non-dual businesses (F1N1, F1N2, F3N1) (Muehlemann & Wolter, 2014, p. 3).

Results also show that costs of training could vary depending on the goals and capabilities of the company: small dual businesses (F2D1, F2D3, F2D4) could train a few trainees

TABLE 2 Identified cost categories for DLS and ad hoc/traditional training.

Dual	Non-dual
Wage payments of hired students (sometimes food, travel, and accommodation costs)	Training payment per calendar day for the employer
Training costs (costs for external and internal personnel): • Wages of mentors • Wages of tutors	Tuition payment (costs for training provider)
Infrastructure costs (providing workplaces, appliances)	Living expenses (if training is provided in another city or country)
Supplies costs (equipment, learning materials)	Travel costs to the place of study
Other costs (e.g., curriculum development, exams, recruitment)	

(students), while large businesses (e.g., F1D5) undertake joint training projects with several businesses for many students, subsequently baring much more costs:

> We invested 100,000 EUR to this project" (F1D5). Training costs overall range from 800,000 to 1,200,000 KZT (approximately 1600–2500 EUR[4]) (F1D1).

Non-dual businesses also reported approximate training costs, ranging from 60 to 500 EUR per employee (F1N2, F2N1–F2N4), which seems to be substantially lower estimates than those made by the dual businesses.

Although the cost of training varies depending on the size of the businesses, scope, and training frequency, other studies also considered training expenses for non-dual businesses to be lower than in DLS (Gambin & Hogarth, 2016, p. 516; Ryan, 2000). Businesses faced challenges in determining the exact financial impact of combining dual and ad hoc/traditional training, even though trainees were committed to working for an agreed-upon period with the training businesses. Only a limited number of respondents could provide data on the cost of staff training, and none reported estimating the income generated from hiring students. Similarly to Smyth and Zimba (2019, p. 91), DLS pay-offs are considered to be students who remain employed at the enterprise after completing their studies and work for at least three to 5 years after graduation (F1D3, F1D1). This common belief is based on cost–benefit studies of CEDEFOP (2014), stating that almost all businesses have substantial net costs for apprenticeship training and will reap benefits (including qualified staff) in the future, but businesses still do not apply cost–benefit calculations.

Impact of the DLS on personnel turnover and attitude of employers on graduate recruitment

In the context of employee turnover, instrumentality in Expectancy Theory refers to the perceived connection between participating in the DLS and the expected outcomes related to reducing employee turnover rates within the organization (Gyepi-Garbrah et al., 2023, p. 3). Specifically, it addresses the belief that the investment (or involvement) in DLS will lead to a

positive impact on employee retention or recruitment of professionals (Das, 2013). Table 3 summarizes the responses of the businesses regarding employee turnover and the impact of learning (DLS/ad hoc) on retention. As shown in Table 3 and Figure 4, of 11 dual businesses, 54% had reported a high employee turnover, compared to 50% in non-dual businesses. All of them are mainly small businesses (45.5% dual and 50% non-dual). Large and medium-sized businesses (36.8% of all businesses), however, reported their turnover situation as follows:

> Our staff turnover is at most 8-9%, which is considered optimal for the company (F1D1).

The positive impact of DLS on employee turnover was observed by only 27.7% dual and 25% non-dual businesses, which are mainly large and medium-sized businesses. Some respondents (27.7% dual and 50% non-dual), however, did not observe any changes or found it challenging to respond due to a lack of available data.

Most graduates do not remain at the small businesses for further employment after graduation:

> Some graduates want to stay after training. It is still a small percentage (F1D4).

Nonetheless, some dual businesses mentioned a positive impact of DLS on employee retention compared to non-dual businesses:

> DLS participation has significantly reduced staff turnover; currently, the company employs three dual graduates (F1D2). Four specialists remained with the company because of the DLS project (F1D5).

Attitudes of employers toward graduate recruitment with DLS and traditional education were also described in the focus group discussions. The satisfaction of employers with the recruited professionals (or graduates) represents the degree to which they value the positive outcomes linked to willingness (or motivation) to invest in training and involvement in DLS. Some dual businesses (F1D1, F1D2) expressed satisfaction with the level of training of graduates. They recognized the advantages of this type of learning over the traditional approach to training:

> The first thing I like about them is that they are easy to train. Also, because they are young, they can jump right into problems, react quickly to instructions, and develop creative solutions. Dual graduates are qualified enough for our needs (F1D1).

Other businesses (mainly small ones) have expressed dissatisfaction with the level of knowledge. They assert that DLS graduates are not considered more qualified than non-dual graduates:

> If I had one vacancy, there is no doubt that I would choose between the two dual and non-dual applicants (F3D1) ...Sometimes, a non-dual graduate is more skilled than a dual one (F2D1).

TABLE 3 Employee turnover and impact of DLS/ad hoc (traditional) training on retention.

	Dual			Non-dual	
Business reference number	**Employee turnover**	**Impact of DLS on retention**	**Business reference number**	**Employee turnover**	**Impact of ad hoc/ traditional training on retention**
F1D1 (Large)			F3N1 (Small)		
F1D2 (Medium)			F1N1 (Large)		
F1D3 (Medium)			F1N2 (Medium)		
F1D4 (Small)			F2N1 (Small)		
F1D5 (Medium)			F2N2 (Small)		
F3D1 (Small)			F2N3 (Small)		
F2D1 (Small)			F2N4 (Medium)		
F2D2 (Small)			F2N5 (Medium)		
F2D3 (Small)					
F2D4 (Small)					
F2D5 (Small)					

- Businesses perceive that DLS/ad hoc(traditional) training does not impact employee retention
- Businesses perceive that and DLS/ad hoc(traditional) training positively impacts the organization
- Due to a lack of data no response was provided

Overall, the findings indicate a divergence of opinions among businesses regarding the dual approach in employee turnover, which poses a potential risk of reluctance to invest in DLS. Similarly, Howe et al. (2023) suggest that employee turnover is predominantly observed in small businesses, and DLS shows limited performance in altering this situation. Large (F1D1) and medium (F1D3) dual businesses mentioned having a personnel reserve, which mitigates staff turnover problems, while small businesses only experience a decline in turnover during the student training period (F1D2, F1D4, F1D5, F2D1, F2D2). These findings are consistent with the study of Bishop (2017), indicating that the retention rate varies according to the size of the company—large and medium businesses have more chances to hire graduates for extended periods. The study of Euwals and Winkelmann (2004) also found that retained graduate apprentices, especially those employed by larger firms, stayed in their first job for significantly longer than apprentices hired by another company. As a result, larger firms are more likely to benefit from lower employee turnover rates.

CONCLUDING REMARKS AND IMPLICATIONS FOR MANAGEMENT AND POLICY DESIGN

This study explores the performance and challenges of DLS by comparing the perceptions of businesses involved in DLS (dual) with those using the traditional approach (non-dual) in training staff, focusing on motivations for providing training and derived benefits. We used Vroom's Expectancy theory as the underlying conceptual framework in conducting qualitative research to understand the motivational forces of the employers of agri-food businesses in their decision-making processes to engage in training activities.

Aside from qualification mismatch, the study unveiled additional reasons for the shortage of qualified workers in the agri-food sector. While there have been enhancements in the recruitment of specialists in dual businesses, young people are not willing to pursue careers in the agri-food industry. Businesses perceive that organizing DLS requires much more investment rather than traditional training. The lack of secondary data on DLS organizational costs does not allow us to assess cost-effectiveness comprehensively. While some businesses may witness positive changes in staff turnover through the DLS, the impact tends to differ across business sizes.

Management implications for businesses

Our findings highlight the importance of investment in personnel training to help them develop and integrate into the workforce of the company, as is also emphasized by Jansen et al. (2015), Lewis (2015) and Muehlemann and Wolter (2020). This is even more important when it comes down to investment in DLS since companies could retain employees with qualifications tailored to the needs of the company (Davoine & Deitmer, 2020; Vogelsang et al., 2022). However, despite the favourable experiences of some dual businesses in recruiting skilled personnel, small businesses express dissatisfaction with the training of graduates. The distinction in the quality of training for dual graduates, setting them apart, frequently relies on the resources and equipment available at the enterprises where they undergo their training. A similar study by Bishop (2017, p. 69) highlights that small businesses reduce long-run unemployment exposure for apprentices, possibly due to differences in training quality

(Horn, 2016). Also, the learning environment in small businesses tends to be less formal than those in large businesses, as large and medium-sized businesses are usually able to provide a more conducive learning environment (Kotey & Folker, 2007). As a characteristic of the agri-food industry, seasonality might potentially impact staff turnover and ineffective training (Devereux & Longhurst, 2010). For instance, in winter,[6] climatic conditions often lead to the suspension or reduced capacity of most production activities. Given that traditional education practice hours align with the general curriculum, a close collaboration with educational institutions in DLS would facilitate incorporating the seasonality aspect into the design of practical training hours (Jahan & Shonchoy, 2018). This would enable the accommodation of additional labour needs during peak harvest periods or other fieldwork activities and contribute to a better student learning experience.

According to our results, it is challenging for employers to provide data for cost–benefit analyses due to the lack of separate cost accounting for training (Gambin & Hogarth, 2016, p. 507). For instance, businesses can purchase consumable materials for a laboratory for employees and students in one transaction. Furthermore, training does not necessarily lead to changes in sales volume, productivity, or other business profit measures since many other factors can influence these parameters (Asghar et al., 2016, p. 80). When businesses fail to effectively assess and communicate the tangible benefits derived from training programs, it creates uncertainty about the value of such investments and can serve as a deterrent for them contemplating investment in employee development (Muehlemann & Wolter, 2014, p. 2). This makes cost assessment and communication of training programme benefits essential to instil confidence in decision-makers and encourage strategic investments in employee development (Das, 2013).

Policy implications for authority bodies

Based on the conclusions drawn from the study, the following recommendations emerge. First, efforts should be made to assist businesses in providing data or feedback on DLS organizations. This can be achieved by implementing regular surveys conducted by responsible entities, such as NCE, the costs associated with organizing DLS, the number of dual graduates hired, employee turnover rate or/and insights into the benefits and challenges of organizing dual training approach at the workplace could be collected from businesses. Existing NCE questionnaires are aimed at assessing the knowledge and skills of students on the part of work-based trainers rather than at the reaction of dual businesses to the DLS. The analysis of the collected information can yield interim reports on the efficacy of dual training, helping in identifying necessary financial incentives to encourage increased business participation and engagement. Second, to comprehend the genuine reasons behind the disinclination of young individuals to retain in the agro-food sector, it is imperative to discern the factors that motivate their selection of an agricultural speciality and their intentions for dedicating themselves to this profession in the future. Students constitute an integral component of the DLS. Only a comprehensive analysis involving all participating parties, businesses, educational institutions, and students will help determine the main factors influencing unemployment in the industry.

[6]Kazakhstan experiences a pronounced continental climate, with limited agricultural activities being possible during wintertime.

This understanding will subsequently facilitate the formulation of targeted measures. Third, incentives for small businesses hiring dual graduates could promote their value and reduce youth unemployment. This could be retaining dual graduates in the training company for a certain period after graduation. Upon completing training under DLS, graduates are required to continue contributing to the company that provided training. Current incentives primarily support graduates' acquired expertise in specialized fields rather than rewarding the businesses that invested in their training. According to the findings of this study, small businesses, which are particularly reliant on specialists, do not experience significant benefits from DLS. Consequently, it is imperative to stimulate retaining graduates in small businesses by reducing the time graduates contribute to pay off their training. This securing employment may stimulate small businesses to get involved in DLS. Finally, steps towards creating the same training conditions across the businesses will improve the training quality of DLS and address concerns of the small agri-food businesses (Böhn & Deutscher, 2021). Training businesses expressing an interest in DLS should adhere to quality training standards, as currently, the legal framework for dual education in Kazakhstan primarily focuses on regulating the activities of colleges rather than enterprises (Doskeyeva et al., 2024, p. 2). It is imperative to formulate regulatory standards that ascertain the alignment of employers of businesses expressing interest in participating in DLS with specific requirements and the provision of adequate equipment to facilitate quality training in the workplace. These standards should encompass the presence of qualified personnel capable of offering mentorship, along with guidelines on the acceptable number of students corresponding to the size of the businesses.

Addressing these challenges necessitates actions from both the organization of the DLS system and broader state-level interventions. In dealing with the above issues, policymakers should consider industry specifics in DLS regulations. For example, developing a curriculum should consider seasonal weather conditions (for fieldwork) to ensure an engaging learning experience for students and support businesses within the workforce.

The main limitation of this study is that it could not calculate detailed cost-benefits incurred in DLS and traditional training to prove conclusively that DLS is an expensive form of training. Such detailed analysis is also out of the scope of the current study setting. Consequently, the study relied on the overall perceptions of businesses regarding expenses incurred in DLS and ad hoc/traditional training of recruits.

Future research in the agri-food sector could focus on conducting a comprehensive cost–benefit analysis by collecting relevant information from dual and non-dual businesses, as well as their employee turnover rates and/or retention levels, for a deeper understanding of the DLS effectiveness. Such types of study are equally required for other sectors where the skill gap is evident and could do with participating in DLS.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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