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Learner Engagement and Perceived Learning Outcomes through a Hands-On Cupcake Decoration Task

Penglibatan Pelajar dan Hasil Pembelajaran yang Dipersepsikan Melalui Tugasan Amali Menghias Kek Cawan

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ABSTRACT

This study examined learner engagement and perceived learning outcomes through a hands-on cupcake decoration task conducted as part of the LingoBites community programme. Small pastry-based activities are often included in community engagement programmes but are rarely analysed as learning experiences in their own right. Guided by experiential and embodied learning perspectives, this study focused on how participants engaged with cupcake decoration and how they perceived their learning after the task. A programme-based evaluative case study design was employed. Data were drawn from programme evaluation instruments involving 18 community participants, including participants' pre- and post-self-assessments, a facilitator observation checklist and participant feedback. The data were analysed descriptively, supported by a simple thematic review of comments and facilitator observations. The facilitator observation score for cupcake decoration increased from 1.4 to 4.4, suggesting positive observed engagement and activity-level progress. Participants' self-assessment score for cupcake decoration increased from 1.88 to 4.06, indicating perceived improvement in basic cupcake decoration knowledge or skill. Feedback also suggested increased confidence, opportunities for creativity and interest in future cake- or pastry-related learning. The findings should be interpreted as short-term programme-based evidence of observed engagement and perceived learning, not as proof of technical pastry mastery or long-term skill retention.

Keywords: Community-based Culinary Education; Embodied Learning; Experiential Learning; Learner Engagement; Perceived Learning Outcomes

ABSTRAK

Kajian ini meneliti penglibatan peserta dan hasil pembelajaran yang dipersepsikan melalui tugasan menghias kek cawan secara amali dalam program komuniti LingoBites. Aktiviti pastri berskala kecil sering dimasukkan dalam program penglibatan komuniti, namun jarang dianalisis sebagai pengalaman pembelajaran yang tersendiri. Berpandukan perspektif pembelajaran berasaskan pengalaman dan pembelajaran berjasad, kajian ini memberi tumpuan kepada cara peserta melibatkan diri dalam aktiviti menghias kek cawan serta bagaimana mereka mempersepsikan pembelajaran selepas aktiviti tersebut. Kajian ini menggunakan reka bentuk kajian kes evaluatif berasaskan program. Data diperoleh daripada instrumen penilaian program yang melibatkan 18 orang peserta komuniti, termasuk penilaian kendiri pra dan pasca, senarai semak pemerhatian fasilitator serta maklum balas peserta. Data dianalisis secara deskriptif dan disokong oleh semakan tematik ringkas terhadap komen peserta dan pemerhatian fasilitator. Skor pemerhatian fasilitator bagi aktiviti menghias kek cawan meningkat daripada 1.4 kepada 4.4, menunjukkan penglibatan yang positif dan perkembangan aktiviti. Skor penilaian kendiri peserta pula meningkat daripada 1.88 kepada 4.06, menunjukkan peningkatan yang dipersepsikan dalam pengetahuan atau kemahiran asas menghias kek cawan. Maklum balas peserta turut menunjukkan keyakinan, peluang kreativiti dan minat terhadap pembelajaran kek atau pastri pada masa hadapan. Dapatan ini perlu ditafsirkan sebagai bukti jangka pendek berasaskan program, bukan sebagai bukti penguasaan teknikal pastri atau pengekalan kemahiran jangka panjang.

Kata kunci: Pendidikan Kulinari Komuniti; Pembelajaran Berjasad; Pembelajaran Berasaskan Pengalaman; Penglibatan Peserta; Hasil Pembelajaran yang Dipersepsikan

INTRODUCTION

Experiential and embodied learning are particularly relevant to pastry education. While decorating cupcakes, the learners will be required to coordinate hand movements with visual design, control pressure, use tools, and exercise aesthetic judgement. The task might seem very simple, but it involves experiential, embodied learning. The experiential learning approach is based on the belief that knowledge is gained through an individual's personal experiences, reflection on those experiences, and subsequent experimentation (Kolb, 1984). The embodied learning approach proposes that learning is not just cognitive but also bodily, involving action and interaction with tools, materials, and the environment (Nguyen & Larson, 2015; Varela et al., 1991). Therefore, cupcake decorating can be seen as a small-scale pastry task, a practical and creative art performed with a sensory component.

Despite the pedagogical potential of hands-on culinary activities, small pastry-based activities in community programmes appear to have received less attention. Previous research on children's cooking education has tended to focus on broader outcomes, including food and nutrition literacy, vegetable consumption, food acceptance, cooking competencies, cooking self-efficacy, and cooking involvement (Omidvar et al., 2023; van der Horst et al., 2024; Vaughan et al., 2024). Likewise, short-term cooking programmes not included in the school curriculum have recently been reviewed to look at cooking skills and self-efficacy in children and adolescents, with less focus on informal cooking activities, such as decorating cupcakes (Bessette et al., 2026). These activities are often reported on community-based programmes as evidence of programme implementation or impact but are not analysed systematically as learning experiences in many programme reports. This can lead to an underestimation of the educational value of simple, low-cost pastry activities, especially regarding engagement, confidence, creativity, and perceived learning outcomes.

Although this study focuses on one small-scale activity within one community programme, its contribution lies in examining a type of activity that is often included in community engagement programmes but rarely analysed as a learning experience in its own right. Cupcake decoration is commonly treated as an enjoyable enrichment task or programme output. However, it also involves

practical participation, bodily coordination, tool handling, sensory judgement, creativity, and social interaction. Therefore, this study offers a practical, context-specific contribution by demonstrating how a simple pastry-based task can be examined in terms of learner engagement and perceived learning outcomes.

This gap is also relevant to LingoBites, a community-based programme in which language, culture, and culinary activities are integrated. The programme was delivered to 18 community members at Taman Carnation and featured foreign language and cultural booths, English language activities, cooking, and cupcake decorating. The programme was designed to offer interactive and fun learning opportunities, and to introduce the participants to the language, culture, and basic culinary skills. The cupcake decoration task was one of the activities within this broader programme and provided a useful focus for examining how learners engaged in a hands-on pastry task and how they perceived their learning following the task.

Thus, this research focuses specifically on the decoration of cupcakes as part of LingoBites. This paper does not evaluate the programme as a whole but looks at one practical pastry task in relation to learner engagement and perceived learning outcomes. This more specific approach enables cupcake decoration to be studied as an experiential and embodied learning activity. The study does not claim that a single cupcake decorating task can build professional pastry skills. Rather, it examines whether the task was associated with learners' participation, confidence, creativity, interest, and perceived improvement in basic cupcake decoration knowledge or skills.

The following research questions guide this study:

1. What forms of learner engagement were observed during the hands-on cupcake decoration task?
2. How did participants perceive changes in their cupcake-decoration knowledge or skills after the task?
3. What perceived learning outcomes and future pastry-learning interests emerged from participant feedback and facilitator observations?

This study contributes to discussions on informal culinary learning by demonstrating how a simple, small-scale pastry-based activity can support learner engagement and perceived learning in a community-based setting.

LITERATURE REVIEW

Hands-On Culinary Learning as Experiential and Embodied Learning

Experiential education is a learner-centred teaching method in which learners build understanding by engaging in meaningful activities. These activities can take place in the classroom, the community, and other applied learning settings. This method is one in which the teacher is seen as a facilitator or coach who sets learning goals, gives guidance to the learner, and allows the learner to draw connections from their own experiences, rather than imposing interpretations on them (Chapman et al., 1992). Thus, experiential education is not just about allowing learners to “do” an activity. It needs intentional activity, guided interaction, and meaningful experiences for the learners.

The process can be explained using Kolb's Experiential Learning Theory. According to Kolb (1984), experiential learning is an iterative process that consists of four phases: concrete experience, reflective observation, abstract conceptualisation and active experimentation. This cycle involves learners experiencing something, reflecting on what happened, forming or reforming their understanding of what it means, and then taking some action based on that understanding. This model applies to hands-on culinary learning as learners are not merely given procedural knowledge regarding recipes, ingredients, or techniques. They learn, however, by observing, trying, adjusting, and repeating actions based on what they see, feel, and do.

Experiential learning is particularly evident in cooking and pastry work as the learner has direct contact with ingredients, equipment, tools, time, texture, smell, taste, and presentation. Recent studies of

practical food-related activities have examined outcomes such as cooking skills, food literacy, self-efficacy, and children's involvement in cooking. For instance, Omidvar et al. (2023) found that food and nutrition literacy interventions with primary-school-age children frequently involve hands-on activities such as cooking, recipe skills, food tasting, food label literacy, and culturally relevant food practices. Likewise, Vaughan et al. (2024) conducted a review of school-based cooking classes and found that cooking skills, food literacy, cooking confidence, and vegetable consumption are often examined in these classes. Similarly, van der Horst et al. (2024) identified cooking skills, self-efficacy, and child involvement in cooking as the most common positive outcomes of children's cooking programmes. More recently, Bessette et al. (2026) found that immersive, short-term cooking programmes outside of the school system had a positive effect on cooking self-efficacy and cooking skills for children and adolescents.

The studies provide useful background showing that hands-on cooking can be a valuable learning experience. Most of this literature, however, focuses on more general cooking- and nutrition-related outcomes, such as food literacy, healthy eating, vegetable intake, cooking involvement, and cooking self-efficacy. There has been less focus on small pastry tasks as learning activities in community-based programmes, particularly in cupcake decoration. This is a relevant gap as pastry decoration is not merely a procedural task but also a creative process involving bodily coordination, sensory judgement, and aesthetic decision-making.

Although Kolb's model is useful, some scholars have noted that it gives strong emphasis to reflection and individual meaning-making. Experiential learning is frequently presented as individual meaning-making through reflection (Miettinen, 2000). In this view, the body might be considered primarily a vehicle for subsequent thought, rather than an integral component of the thinking process. This limitation is relevant in culinary and pastry training because practical knowledge develops not only through reflection but also through movement, hand-eye coordination, tool handling, sensory judgement, and manipulation of materials.

The embodied and enactive learning perspectives provide a helpful addition to experiential learning. Varela et al. (1991) proposed that cognition is an active process of sensorimotor interaction between the person and the environment, and that perception and action are tightly coupled. In this perspective, learning is not detached from the body. It is developed by movement, touch, perception, and interaction with tools and materials. Nguyen and Larson (2015) similarly argued that embodied pedagogy should engage both body and mind in the process of knowledge construction. Recent research also underscores the importance of embodied cognition in learning and instruction, especially in contexts involving bodily action, gestures, and object manipulation (Castro-Alonso et al., 2024).

This way of thinking is very applicable to cupcake decorating. Simple as cupcake decoration might sound, learners are expected to coordinate the movement of their hands, control pressure, work with piping bags, arrange colours, consider space, respond to the texture of icing or cream, and make aesthetic decisions. The learners watch the facilitator, copy techniques, practise the movements, refine their techniques, and reflect on how the decorations look on the finished product. In this sense, cupcake decoration can be interpreted as experiential and embodied. It is about learning by doing, engaging the senses, manipulating materials, and making choices.

Recently, in culinary education, there have been studies supporting hands-on activity as well. Sharif et al. (2024) stated that culinary and foodservice subjects have a strong practical component, and distance learning for practical culinary subjects was a significant challenge due to the lack of hands-on experience. Sharif et al. (2026) also demonstrated how communal culinary practices like rewang could be used to aid in the understanding of culinary processes, teamwork, communication, cultural appreciation, and community engagement for learners. Although cupcake decoration is smaller in scale than rewang, both activities demonstrate that culinary learning can be technical, social, creative, and experiential.

For this reason, experiential and embodied learning are presented as complementary perspectives in this study. Experiential learning is the process by which a learner acquires knowledge and understanding through doing, reflecting, and then repeating the activity. Embodied learning is the concept that physical activity, sensory evaluation of the world, and encounter with objects and tools play a role in the learning process. These two views offer a suitable lens for understanding the engagement of learners in a practical task of cupcake decoration and what they perceive as learning.

Learner Engagement and Perceived Learning Outcomes in Culinary Activities

Learner engagement is an important concept for understanding how participants respond to hands-on cooking and pastry activities. Engagement is often defined as a multidimensional concept that encompasses aspects of behaviour, emotions, and thinking. Behavioural engagement is characterised by the way a student engages with learning through participation, effort, and involvement. Emotional engagement relates to the learner's interest, enjoyment, confidence, and positive emotions about the task. Cognitive engagement encompasses attention, decision-making, reflection, and a willingness to improve one's performance. Reeve et al. (2025) found that there are different kinds of engagement for different kinds of learning-related purposes, and that there are strong links between behavioural engagement and achievement, and between emotional engagement and motivation and well-being.

This multi-dimensional approach to engagement can be helpful in analysing hands-on pastry activities. Behavioural engagement can be observed amongst learners in cupcake decoration by their active engagement, handling of tools, following of instructions, and completion of the decorated cupcake. Emotional engagement can be demonstrated by enjoyment, confidence, willingness to try, and interest in the final product. Cognitive engagement can be observed if learners make design decisions, make comparisons, alter hand movement, and assess the look of their work. Engagement can take these forms, especially in community-based learning, where it is not typically driven by formal tests or grades. Rather, learning can be manifested in participation, confidence, creativity, co-operation, and the desire to learn more.

Recent research on cooking and food education suggests that hands-on food activities may be associated with confidence and self-efficacy. For instance, an experiential nutrition and cooking education programme was associated with children's positive attitudes and self-efficacy with healthy eating and cooking (Soldavini et al., 2022). In a similar study, Schmidt et al. (2022) reported that a hands-on after-school culinary education program was well received by children and was related to improvements in self-reported eating behaviours and culinary skills. The results of these studies indicate that, in addition to technical or nutritional outcomes, affective or perceived learning outcomes may also result from practical cooking activities.

Learners' perceived learning outcomes are particularly important in informal and community culinary learning. The intent is usually to allow the participants to try new things, gain confidence, foster creativity, promote involvement, and generate enthusiasm for further learning. For this reason, learners' own perceptions of improvement are useful, but they should be interpreted with care. This shows that the participants perceive that they have improved in cupcake decoration, not that they have actually mastered the tricks and techniques of the trade. This distinction is relevant since many cooking education studies use self-reported measures, such as self-reported cooking knowledge, cooking confidence, self-efficacy, or cooking frequency or involvement in cooking, as part of the measures used. Van der Horst et al. (2024) reported that the positive outcomes of children's cooking programmes in cooking-skill knowledge, self-efficacy, and child cooking involvement are commonly reported and highlighted a need for better measurement and clearer programme descriptions. Likewise, Bessette et al. (2026) noted that short-term cooking programmes differ in terms of the design, indicators of outcomes, and how they are assessed. A number of methodological issues indicate that the perceived learning outcomes should be closely examined, particularly if the data available for analysis are from programme evaluation but not from controlled experimental studies.

For cupcake decorating, perceived learning outcomes may include learners' beliefs that they can decorate a cupcake, use simple pastry equipment, apply simple decoration techniques, make creative decisions, and create a visible product. In community-based learning, these outcomes are modest but educationally meaningful. Learners with limited prior familiarity with cupcake decoration may experience an increased sense of capability after successfully completing the task. This confidence may help to encourage future interest in pastry work.

The current literature, however, pays little attention to small activities involving pastry, such as cupcake decorating. There has been a recent interest in studying cooking programmes, food literacy, cooking self-efficacy, healthy eating, and cooking-skill development among others (Omidvar et al., 2023; Soldavini et al., 2022; Schmidt et al., 2022; Vaughan et al., 2024; van der Horst et al., 2024; Bessette et al., 2026). These studies are valuable, but they primarily address the more general cooking and nutrition outcomes. They do not fully describe how a basic task of pastry decoration can contribute to the engagement, creativity, confidence, and perceived learning outcomes of a community-based programme.

METHODOLOGY

Research Design

A programme-based evaluative case study design was used in this study. This design was suitable for this study as it involved a single, bounded activity (decoration of cupcakes) within a larger community programme. The study did not evaluate the whole programme but focused on one hands-on pastry task to examine learner engagement and perceived learning outcomes.

The study was evaluative, since it was based on information gathered during the programme, such as self-assessment by the participants, observation, and feedback from the facilitators. It was also descriptive in nature because it did not test causal effects, but rather identified observed patterns of engagement, perceived improvement, and reported learning outcomes.

No experimental design, control group, or random assignment was used. Thus, results should be seen as a reflection of the extent to which the learners engaged with the programme and experienced improvements in their perceptions of learning within the programme, not as evidence of learning gains affected by the cupcake decoration task alone. This design was appropriate for the exploration of a small-scale community-based culinary activity, where the primary interest was in determining how engaged they were in the activity, how confident they were in executing the activity, how creative they were in their approach to the activity, and how they felt about what they learned after completing the activity.

Context of the Study

The study was carried out as part of LingoBites, a community-based programme that took place at Taman Carnation, Penang, with local community participants. Overall, the programme was a mix of language, cultural, and culinary activities. These included foreign-language and cultural booths, English-language activities, cooking demonstrations, and cupcake decorating. This paper concentrates on the cupcake decoration task. It involved practical participation, tool handling, creativity, sensory judgement and learner interaction.

The cupcake decorating activity was designed as a hands-on culinary experience, allowing the participants to become familiar with the fundamentals of cupcake decorating. Participants were guided by the facilitators and involved in a hands-on activity in which they decorated cupcakes using ingredients and basic materials. Participants were asked to follow the instructions, manipulate the materials, learn some decoration skills, and decorate a cupcake.

Participants

The programme involved 18 community participants from Taman Carnation. In this paper, as the concern is with programme-level learning outcomes rather than individual outcomes, participants are referred to as community learners. The 18 participants ranged in age from 19 to 61 years and comprised

six males (33.3%) and 12 females (66.7%). As the available programme evaluation data were analysed at the group level, individual demographic profiles were not included in the analysis. The analysis does not contain any names or personally identifiable information.

Instruments and Data Collection

Three programme evaluation instruments were used to gather data during the implementation of LingoBites.

The first instrument was a pre- and post-self-assessment form to examine the level of perceived knowledge or skill prior to and following the programme. The five-point scale was used to indicate the level of understanding or skill of the participant. This study used the Cupcake Decoration item. The instrument was used to investigate the changes in the participants' knowledge or skill of cupcake decoration.

Second, a facilitator observation checklist was used to record learner engagement and activity-level progress. Facilitators were asked to complete the checklist before and after the activities using a 5-point Likert scale. The corresponding activity category used in this study was Cupcake Decoration. Indicators of participation, interest, confidence, communication, creativity, and understanding were used on the checklist to evaluate the behaviour, level of involvement, and progress of the participants.

Third, the perceived learning outcomes and future pastry-learning interests were identified using the participant feedback forms and facilitators' comments. These were qualitative responses which gave further information on the participants' experiences of the activity and whether the activity prompted interest in future cooking or learning related to pastry.

The instruments were designed for programme evaluation purposes. They were useful for documenting participants' immediate responses, perceived improvement, and observed engagement. However, they were not validated research instruments and were not designed to objectively measure technical pastry competence.

Table 1: Data Sources and Research Questions

Research Question	Data Source	Focus of Analysis
RQ1: Learner engagement	Facilitator observation checklist	Participation, confidence, creativity, understanding
RQ2: Perceived knowledge or skill change	Pre- and post-self-assessment	Perceived cupcake decoration knowledge or skill
RQ3: Perceived outcomes and future interest	Participant feedback and facilitator comments	Confidence, creativity, future pastry-learning interest

Data Analysis

The quantitative data were analysed descriptively. The pre- and post-programme mean scores were compared by calculating the difference between the scores before and after the activity. Two similar but different measures were examined. The first measure was the participants' self-assessment score on cupcake decoration. This reflected the participants' perceptions of their knowledge/skills before and after the activity. The second measure was the facilitator observation score for cupcake decoration, which reflected observed participation, confidence, creativity, and understanding. The two measures were analysed separately because they captured related but distinct aspects of learning and were derived from different instruments. The perceived improvement was discussed using the participant self-assessment score, and the observed level of learner engagement and progress in activity level was discussed using the facilitator observation score.

The qualitative data were analysed using a simple descriptive thematic approach. Participant feedback and facilitator comments were read repeatedly to identify responses related to the research questions. Recurring ideas were then grouped into broad categories, including participation, willingness to try, confidence, creativity, cooperation, application of decorative skills, and future interest in learning pastry.

The analysis was guided by the research questions and was used to support the descriptive quantitative findings, rather than to generate a full qualitative theory. Inter-rater reliability was not calculated for the facilitator observation checklist. Therefore, the observation scores may reflect facilitator judgement and should be interpreted cautiously.

Ethical Considerations

This study was based on programme evaluation data gathered in the process of implementing LingoBites. Names and personal identifiers were not included in the analysis. Participants are referred to as a group to ensure confidentiality. The analysis was based on programme-level engagement and perceived learning outcomes rather than on individual-level assessments.

FINDINGS AND DISCUSSION

Learner Engagement during the Cupcake Decoration Task

The results show that the cupcake decoration activity appeared to support learner engagement during the programme. The results for the activity category Cupcake Decoration showed that the mean score increased from 1.4 to 4.4, an increase of 3.0 points as observed during the activity.

The observation data indicated that a hands-on activity was associated with positive observed engagement. Participants' active involvement, willingness to try, and cooperation were reported by the facilitators during the cupcake decoration activities. The participants were also found to apply basic decoration skills with guidance. This suggests that the cupcake decoration task was linked to observed behavioural engagement that was manifested through active participation, task completion, cooperation, and following the facilitators' instructions. This interpretation is consistent with engagement literature, which views behavioural engagement as participation, effort and involvement in learning activities (Reeve et al., 2025). The observed engagement could be due to the nature of the task. In cupcake decoration, the participants needed to use materials, watch demonstrations, use simple tools and create a visibly decorated product. This is not a passive activity because it demands learners' physical involvement and decision-making. From an experiential learning perspective, this facilitates learning through first-hand experience and hands-on feedback (Kolb, 1984). From an embodied learning point of view, the activity also demanded that learners coordinate their hand movements, control pressure, exercise visual judgement, and interact with the pastry materials (Nguyen & Larson, 2015; Varela et al., 1991).

The findings suggest that cupcake decoration may function as a practical engagement task in a community-based learning context. This aligns with previous studies showing that hands-on cooking activities can encourage learner involvement and participation, although those studies focused mainly on broader cooking or nutrition-related programmes rather than pastry decoration specifically (Bessette et al., 2026; van der Horst et al., 2024; Vaughan et al., 2024). The cupcake decoration provided an actual task to be accomplished and opportunities for creativity and expression. This is significant in a community-based learning environment because the participants might not be driven by assessment. In such settings, engagement may instead arise from enjoyment, active participation, the visible progress of the task, and facilitator support.

Changes in Participants' Perceived Cupcake Decoration Knowledge or Skill

The data from the pre- and post-assessments demonstrated some improvement in participants' self-assessment of knowledge and/or skills in cupcake decoration. The pre-programme mean score for the item Cupcake Decoration was 1.88, and the post-programme mean score was 4.06, representing a gain of 2.18 points.

This finding suggests that participants perceived an improvement in their cupcake-decorating knowledge or skills after the task. The increase is meaningful because it reflects participants' perceived confidence or sense of capability. The mean score before the activity was relatively low, indicating a lack of knowledge or confidence in cupcake decoration. The score rose substantially following the activity, suggesting that learners perceived an improvement in their ability to understand and perform

the activity. The score does not reflect mastery of pastry skills but rather participants' perceived improvement. The study lacked a product-based rubric, expert evaluation of the decorated cupcakes, and a delayed follow-up test. Therefore, the findings should not be interpreted as evidence that the activity resulted in technical expertise in cupcake decoration. A more defensible interpretation is that the task was associated with participants' perceived learning, self-confidence in cupcake-decoration techniques, and familiarity with basic techniques.

This finding is noteworthy because perceived learning is meaningful in an informal community-based education setting. The aim of the activity was not to provide formal technical training but to foster confidence, creativity, and interest. In this regard, an improvement in the self-assessment score would be considered valuable evidence of learning from the task.

Perceived Learning Outcomes and Future Pastry-Learning Interest

The qualitative feedback also supports the finding that the cupcake decoration stimulated perceived learning and ongoing interest. Most of the participants reportedly expressed interest in continuing the practices learned during the programme, and participants responded positively to the programme. For example, one participant indicated they would like to learn how to make a cake, and another indicated they would like to learn how to make pudding, butter cake, etc., in the future.

These remarks imply that the pastry work was not just for short-term enjoyment. It also appeared to encourage interest and curiosity in further cake- or pastry-related learning. Although these comments do not show long-term learning or continued practice, they suggest that the cupcake decoration task may have encouraged curiosity and an interest in future learning about pastry-related activities. This finding is consistent with studies suggesting that hands-on food-related learning may support affective outcomes such as confidence, interest and self-efficacy, although the present study focuses specifically on perceived outcomes in cupcake decoration (Soldavini et al., 2022; van der Horst et al., 2024).

Overall, the results indicate three major perceived learning outcomes. The task fostered confidence, as participants indicated an increase in their perceived knowledge or skill following the task. Second, the task provided opportunities for creativity, as participants were able to make decisions in terms of colour, theme, and finishing when decorating their cupcakes. Third, the task appeared to stimulate future interest, as participants expressed a desire to learn more about cake- and dessert-related skills.

Cupcake Decoration as an Experiential and Embodied Learning Task

The findings can be interpreted through the perspectives of experiential and embodied learning. The activity was hands-on as participants were not just told about cupcake decoration. They observed, handled materials, practised techniques, and produced a decorated cupcake. This reflects the experiential learning process of doing, observing, adjusting, and applying.

The activity was also embodied, as learning required action and sensory interaction. They were required to coordinate hand movement, apply pressure, use piping bags, arrange colours and respond to the texture of cream or icing. This suggests that learning in cupcake decoration involves not only cognitive processes but also bodily action, sensory judgement, and interaction with tools and materials. It happened as a result of the relationship among body, tools, materials, and visual outcomes (Castro-Alonso et al., 2024; Nguyen & Larson, 2015; Varela et al., 1991).

The findings are consistent with recent research suggesting that hands-on cooking activities may be associated with cooking skills, food literacy, self-efficacy, and learner involvement (Bessette et al., 2026; Schmidt et al., 2022; Soldavini et al., 2022; Vaughan et al., 2024). This study, however, adds context-specific evidence; rather than focusing on a large cooking or nutrition programme, it concentrates on a small pastry-based task. The results demonstrate that with a well-designed facilitation process and a focus on active learning, a basic pastry-making experience may contribute to engagement, perceived learning, and future interest.

Overall Interpretation of Findings

Overall, the findings indicate that the hands-on cupcake decoration task appeared to support learner engagement and perceived learning outcomes within the LingoBites programme. The facilitator observation score for cupcake decoration increased from 1.4 to 4.4, suggesting positive observed engagement and activity-level progress. The participants' self-assessment score for cupcake decoration increased from 1.88 to 4.06, indicating improved perceived knowledge or skill. Qualitative feedback further showed positive responses and interest in future pastry-related activities. These findings should be understood as programme-based evaluative evidence. They show that participants appeared engaged and perceived themselves as having learned from the task. However, the findings do not prove long-term retention or technical mastery and should be interpreted as short-term programme-based evidence.

CONCLUSION

Summary of the Study

Overall, the study suggests that the hands-on cupcake decoration activity provided participants with a positive and engaging learning experience within the LingoBites programme. Through the activity, participants had the opportunity to participate actively, try basic decorating techniques, explore their creativity, and build confidence in carrying out the task.

The activity also suggested that a simple hands-on task may create a more relaxed and enjoyable learning environment, especially in a community-based setting. Participants were able to learn by doing, gain practical experience, and develop an interest in learning more about pastry-related activities. Although the findings reflect only the short-term experience of this programme, they indicate that hands-on activities such as cupcake decoration may be useful for encouraging participation, confidence, and continued interest in learning.

Implications of the Study

The study employed a programme-based evaluative case study design and concentrated only on the cupcake decoration aspect of the programme and not the entire programme. This focus enabled the activity to be considered a small-scale, experiential, and embodied pastry activity. The findings indicate that the cupcake decoration task may support learner engagement and participants' perceived improvement in learning. The self-assessment by participants revealed an improvement in their cupcake decoration knowledge or skills after completing the task, and the facilitator observed positive growth in the cupcake decoration task. Feedback from the participants also indicated a desire to learn more about pastry in the future. Generally, the task was seen as conducive to participation, confidence, creativity, and perceived practical learning in the context of the community programme.

This study indicates that simple pastry-related activities can serve as meaningful hands-on learning tasks in community-based programmes. Cupcake decoration is a small-scale activity, but it offers learners opportunities to produce a visible outcome, practise techniques, observe results, and make creative decisions. This may make the learning process more engaging, particularly for novice learners. This study also emphasises the value of experiential and embodied learning views when dealing with informal culinary activities. Such activities involve learners using tools to control hand movement, make design choices, and interact with materials. Practical pastry work may therefore support procedural familiarity, confidence, sensory judgement, and creativity. The results suggest that for programme facilitators and organisers, it is important to carefully plan and design culinary activities that can be used as learning opportunities. Recognising such activities not merely as programme outputs but as learning opportunities, and considering how participants interact with them, what they feel they have learned, and whether they have developed an interest in further learning, can provide a more meaningful understanding of their educational value. The study also implies that programme reports should examine how participants engage with specific activities, rather than treating hands-on tasks only as evidence of programme implementation.

Limitations and Future Research Suggestions

Several limitations should be acknowledged in this study. First, the study involved a small group of community members, so the findings cannot be widely generalised. Second, the data were gathered using the programme evaluation tools such as participant self-assessment, facilitator observation, and participants' feedback. Although useful for examining perceived learning and observed engagement, they were not objective measures of technical pastry competence. Third, the study was limited to the immediate outcomes. No delayed follow-up was conducted to assess the retention of skills and/or continued practice after the programme. Fourth, a formal product rubric was not used to evaluate the decorated cupcakes. Hence, the results must be interpreted as evidence of perceived improvement and observed engagement and not as evidence of mastery of pastry-making skills.

Further research could include a larger sample of participants and the use of more structured questionnaires and instruments. Evaluation of the decorated cupcakes can be carried out using a product assessment rubric based on criteria such as neatness, technique, and creativity/presentation. Short learner reflections and/or interviews might also provide a deeper understanding of how participants experienced the task. Follow-up could also be used in future research to investigate whether participants recall and/or use the knowledge acquired as a result of the programme. Future studies could also compare cupcake decoration with other simple culinary tasks, such as cookie decoration or basic baking, to examine how different activities may support engagement and perceived learning in community-based culinary education.

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