

CHAPTER 24

HOME SCIENCE

Doctoral Theses

01. ARYA (Yatika)
Experiences of Early Literacy Development of Children and Teachers in School.
Supervisor: Prof. Priti Joshi
Th 27512

Abstract

Early literacy is foundational to human development and life-long learning. Research studies about teacher's beliefs on early literacy in Indian context are scant. Nonetheless, few research studies that are conducted in Indian classrooms have established that teachers beliefs impact children's literacy outcomes in early years. Moreover, extant research has indicated that there is limited understanding of early literacy development in school setting and the active role of child is missing in practice. The present study discussed children's and teachers' experiences of early literacy development in three primary schools of Delhi through ethnographic grounded theory analysis approach. This study was undertaken with the reasoning that children's voices needed to be integrated in the foundational literacy teachers' development programmes in Indian context. The three participant schools with differential resource capacities were purposively selected to understand the issues and challenges encountered by children learning in disadvantaged, low-socio-economic situations in India. In this research study, data were constructed employing different methods of naturalistic observations, in-depth interviews, focus group discussions, informal conversations and study of artifacts related to literacy development in the selected school settings, over a period of one academic year. Four core categories of research findings about children's and teacher's experiences of early literacy development in three schools were derived. The findings demonstrated young children's natural propensity to employ a variety of mediums and modes for meaning making and collaborative literacy production in different formats across three schools. Tuitions at home addressed reading and/or writing difficulties for many children across schools. The research findings also identified inconsistencies between teacher's beliefs about developing literate confidence in young children and their pedagogical practices. Children's literature was both unavailable and underutilized in the three schools. Optimum use of digital technology for foundational literacy development and continuous teacher professional development is recommended.

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02. CHAUHAN (Pooja)
Assessing the Quality of Fat used in the Unorganized Food Sector.
Supervisor: Prof. (Dr.) Sukhneet Suri
Th 27513

Abstract

Small scale prolonged intermittent frying (street-sides) may lead to thermal abuse of frying oil. It leads to development of several harmful polar compounds, the

consumption of which is associated with increased risk for non-communicable diseases. Consumer behavior, the knowledge, attitude and practices of vendors belonging to the unorganized sector and the quality of fats/oils being used for frying bhaturas was therefore studied. The research was carried out in Delhi. Based on inclusion-exclusion criteria, consumer behavior (N=500) and the knowledge attitude and practices of 100 SFVs were studied. Samples of fresh and used fat/oil were collected from the site of frying and analyzed for acid value(AV), iodine value(IV), peroxide value(PV), refractive index(RI), total polar compounds(TPC), temperature of frying, fatty acid profile (13 fatty acids). Greater proportion of men (60%) as compared to women ate chole-bhatura and with more frequency, sensory appeal and taste being the major reasons. Although 73.4% respondents agreed that it is not safe to reuse oil for frying, yet 62% were reusing it at least once for frying and 6 per cent till the oil could be reused, indicating poor frying practices. The replenishment of used oil with fresh oil was common(83%). Average temperature of frying medium was 120.3 ± 22.1 and 124.4 ± 23.7 C for fresh and used fat/ oil samples respectively, smoking was observed. Significant linear increase in mean AV (55%), FFA (35.4%), PV (81.3%), RI (7.3%) and TPC (156.02%) was found. Mean decrease in IV was 15.3%. Total mean SFA increased by 12.4%. While the mean MUFAs reduced by only 1.1%, the PUFAs decreased by 22.3% post 6-8 hour frying operation. Conclusion: The results provide a database regarding the changes in fatty acid composition, TPC, FFA, IV, RI of fats/oils subsequent to frying. Awareness on safety aspects of fried foods and frying operations is lacking.

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03. DEV (Pranjali)

Literacy at Home: Parental Practices and Children's Experiences During Early Childhood Years.

Supervisor: Prof. Priti Joshi

Th 27514

Abstract

The present study explored how families with children in their early childhood years practice and experience literacy in their homes using a qualitative methodological approach. Despite a general appreciation for the potential of literacy in India, there is a paucity of research regarding how literacy develops during the early childhood years. To fill this gap in knowledge, this doctoral research was designed to draw out familial literacy beliefs, explore how families support children's early literacy development and study children's literacy experiences at home. Thirty-four children in the age group of six months to eight years, living in Delhi, India, were selected as the principal participants of the study. Six children out of the larger sample were part of an in-depth detailed study. Data was collected through caregiver interviews, observation of literacy objects in the home environment, naturalistic observation and observation of play interaction between caregiver and child. Through this study, diverse home literacy practices across oral, print-based, visual, and play & movement-based modes were identified, suggesting a multimodal nature of literacy in homes, which stretches beyond the traditional framework of oracy, reading and writing and including new technologies. Caregiver beliefs about common literacy aspects and practices like language preference, storytelling, rhymes, reading, and digital engagement, brought forth many insights about why some practices are accepted in families, while others are not. This study was also able to bring to light several familial literacy beliefs which were shaped by culture. Furthermore, it was found that caregivers see helping children access and thrive in rich literacy spaces as a key way of supporting literacy development. This research has offered insights about caregiver

motivations and beliefs about early literacy which has the potential to bring positive change to children's literacy learning.

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04. JAIRAM (Monica)
Early Childhood Education Practices During Pre-Covid, Covid and Post-Covid Times in Selected ECE Centres of Delhi-NCR.
 Supervisor: Prof. Geeta Chopra
Th 27516

Abstract

Early childhood education refers to providing informal education to children from 3 to 6 years of age through ECE centres. It prepares the children for future formal learning and provides an appropriate learning environment. It also becomes important when 80% of brain development occurs during these years. However, a sudden health emergency occurred during COVID-19 which led to the closure of ECE centres, hence impacting the opportunities being provided to children of early years. The current study was undertaken with the broad objective of exploring early childhood education practices in selected early childhood education (ECE) centres of Delhi and NCR during pre-COVID, COVID and COVID times. The specific objectives were: to explore and document curriculum transactions and early learning inputs in the selected ECE centres during the pre-COVID time, during COVID-19 and post-covid times; to investigate the role of administrative heads, teachers & and helpers in planning and conducting classes in the selected ECE centres; to understand from parents their engagement with children, teaching methods used by ECE centres and their involvement in implementing early childhood education during COVID-19 and to compare pre-COVID, COVID and post COVID early childhood education practices in the selected ECE centres. The study was qualitative in nature using an exploratory research design. The sample of the study was 10 ECE centres, staff members of these centres and 20 parents. The sample selection was done using purposive and snowball sampling. The results of the study revealed that each ECE centre was unique within itself, each of them had its own method of delivering activities to children that were structured and flexible, unstructured and child-chosen, and play-based methodology before COVID. Cascading model, SIT model and online-based methods emerged to be used during COVID times. And post COVID again re-connecting of pre-COVID methodologies were adapted. The centres were found to be using the majorly same activities however, their method of delivery varied. The parents became both the nurturer and an ECE educator during COVID times as they were the key person in making ECE activities available to children in collaboration with ECE centres.

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05. NAAZ (Shumaila)
Screening and Extraction of Penicillium Purpurogenum for Textile Dyeing.
 Supervisors: Prof. Charu Gupta and Prof. Sunita Aggarwal
Th 27893

Abstract

This research focused on the isolation, optimization, and application of microbial colorant from Penicillium purpurogenum, which produced a rich red pigment,

particularly effective on silk and wool. The pigment production was optimized using Czapek Dox Broth with an optical density of 1.035 at 530 nm. Dextrose and peptone were the best carbon and nitrogen sources, respectively yielding O.D. values of 1.048 in 24 days and 1.084 in 21 days. Large-scale production in 3000 mL flasks reached an O.D. of 1.084 in 18 days, shortening the incubation time. The colorant was extracted and characterized, yielding 3.4 grams of dry powder from 250 mL crude colorant. *Penicillium purpurogenum* colorant was chemically characterized using FTIR, revealing functional groups typical of acid dyes like sulfonic and hydroxyl, enhancing its solubility. Proteolytic activity, confirmed through casein agar plates at 15°C, 28°C, and 37°C, showed enzymatic degradation, while antimicrobial assays demonstrated selective activity against gram-positive bacteria, suggesting potential applications in bacterial inhibition. The various textile fibers were dyed using *Penicillium purpurogenum* colorant, with wool and silk absorbing the dye best, showing deep red colors. Optimal dyeing conditions for wool and silk were at pH of 4, with equilibrium reached in 40 minutes, following the Langmuir isotherm model. Microbial-dyed wool was softer and stronger than chlorinated wool, with proteolytic enzymes aiding scale removal. While showing good washing and rubbing fastness, improvements in light fastness were needed. The best discharge result was achieved with gum arabic at 10% concentration of Rongalite C, steamed at 110°C for 10 min, producing a white discharge. However, yellow discharge occurred with TKP and CMCTKP due to the multicomponent nature and selective reduction of the dye. This dual discharge outcome white with gum arabic or tragacanth, and yellow with TKP or CMCTKP highlights a unique property of microbial dyes

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06. NARULA (Aprajita)

Happiness Curriculum and the School Ecology: Paradigm, Beliefs and Influences on School Children.

Supervisor: Prof. Mani Bhasin Kalra
Th 27892

Abstract

The present study was undertaken to explore the paradigm of happiness and beliefs about the Happiness Curriculum, implemented in state-run schools of Delhi and its influence on school children. The study participants included 40 teachers teaching Happiness Classes with a teaching experience ranging from 2-29 years along with 40 students of Grades VII and VIII in the age range 12-15 years from state-run schools. The study participants also included 15 Curriculum Developers, 10 Happiness Coordinators and 10 parents. For Focus Group Discussions, 10 groups comprising a total of 56 students of Grade IX and X in the age range of 14-17 years were taken. Each group comprised 4-8 students. Interviews, Focus Group Discussion and classroom observations were conducted to elicit participant responses regarding their beliefs about Happiness and Happiness Curriculum. The data obtained was subjected to thematic content analysis. The study revealed that participants construed happiness as a multi-component phenomenon. It was associated with low arousal positive emotions and was believed to exist along the three dimensions, i.e., the individual, social, and transcendental. At the individual dimension, fulfilment of material desires, engagement in pleasurable pursuits and attainment of goals were considered to bring happiness. The social dimension included experiencing positive relationships with members of family, friends and society. The practicing of human

values of love, respect, gratitude etc, for the upliftment of self and others were also included. Lastly, the transcendental dimension attained through realization of purpose of human life and living in harmony was considered as bringing ultimate and lasting happiness. Happiness Curriculum was construed as a positive intervention for improving the well being of school children. The different content components of the Happiness Curriculum were reported to have distinct benefits that were considered to contribute to the development of the child's potential and his/her well-being. The benefits were observed across the socio-emotional and cognitive domains. Despite the positive outcomes, gaps were apparent with regard to curriculum implementation. Lack of teacher training and willingness, teacher workload, academic prioritization, and lack of preparedness for the class were some factors identified as hampering effective curriculum implementation. However, participants were optimistic that if concerted efforts are taken to overcome the challenges, Happiness Curriculum can foster the development of happy and virtuous human beings.

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07. PUNIA (Namrata)

The Relationship Among Emotional Intelligence, General Intelligence and Academic Performance of College Students (18-24 Years) From University of Delhi.

Supervisors: Prof. (Dr) Renu Malaviya, Prof. (Dr) Jayanti Dutta and
Prof. (Dr) Yukti Sharma

Th 27520

Abstract

This correlational study was intended to examine the relationship of emotional intelligence (EI), general intelligence and academic performance with gender, age and academic levels of students of University of Delhi. In this study the predictor variable was emotional intelligence and criterion variable was academic performance as measured by students' annual percentage. Emotional intelligence was measured with the help of BarOn Emotional Quotient Inventory (EQi and Dalip singh and N.K Chadda tool of knowing your emotional intelligence whereas general intelligence was measured with help of Standard progressive matrices tool developed by R.C. Ravens. The validity and reliability of EQi , SPM and Dalip singh's tool were measured and the instruments were found to be valid and highly internally consistent. Correlation analysis, regression analysis and ANOVA were performed to test the hypotheses. Results indicated a significant correlation between emotional intelligence, General intelligence and academic performance of the students. Emotional intelligence was found a significant predictor of academic performance. Significant correlation was found between age and emotional intelligence. There was no difference in the mean EQi scores of male and female students except on stress management scale where male students scored higher than female.

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08. RANA (Anjali)
An Exploratory Study on Stress among School and College Students: Causes and Coping Strategies.
 Supervisors: Prof. Veenu Wadhwa and Prof. Renu Gulati
Th 27520

Abstract

Stress is an inevitable part of human life, affecting individuals across all ages and stages of life. Stress can be caused by environmental factors, psychological factors, biological factors, and social factors. Coping with stress during student life can be extremely challenging. Learning to regulate stress can help students deal with social and academic challenges on a daily basis. Thus, this study investigates the prevalence of stress among school and college students, examining the causes of stress, coping strategies employed by students to manage stress, and the intensity of stress experienced before and after examinations. The present study was carried out on 120 Co-ed Private Schools and 120 First year Under-Graduate students of University of Delhi. Two Co-ed Private Schools and Two co-ed Colleges of University of Delhi was selected. The tools used in the study were Perceived Stress Scale Student Stress Rating Scale, Ways of Coping -Brief COPE Scale; and Focus Group Discussions. The findings of the study revolved around three main broad themes- prevalence of stress, causes of stress, and stress coping strategies used by school and college students. According to quantitative analysis, the Chi-Square analysis also suggest that there is no significant difference between prevalence of stress among school and college students because the p value of the test is more than 0.05. In terms of causes of stress among school and college students the major cause of stress among school students was emotional stress and on the another hand, major cause of college students stress was Physiological Stress. School and College Students use Emotion focused coping to overcome their stress irrespective of their gender and stream of the study. The researcher prepared a Stress Management brochure for students which will be helpful for them to overcome their stress.

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09. RENU
Awareness of Child Rights: A Study on Students Pursuing B. Ed. Programme in Delhi.
 Supervisor: Prof. Geeta Chopra
Th 27521

Abstract

The study primarily aims to review the inclusion of child rights content in the syllabi of B. Ed. programs across Indian universities and to understand the awareness of child rights among students pursuing B. Ed. programme. The researcher used a mixed-methods approach for data collection and analysis. The objective of the study was to review child rights content in the B. Ed. syllabi of Indian universities offering regular B. Ed. programme and to understand B. Ed. students' awareness of child rights. The sample of 28 B. Ed. syllabi were selected from across the country, and desk review of syllabi was done using the checklist. The sample of 405 B. Ed. students from Delhi was selected using convenience sampling, and their views on child rights were collected using a questionnaire. In-depth exploration of child rights violations was done using focus group discussions. The collected data was analysed using descriptive analysis, statistical analysis (Excel and SPSS software) for quantitative data, and thematic analysis for qualitative data. The results of the study revealed that most of the B. Ed. syllabi lack a mention of child rights. Right to

Education and Disability rights were highly mentioned in most of the B. Ed. syllabi. The 'legal age of a child in India' was stated 14 years by the majority of B. Ed. students whereas the meaning of the child rights was associated with the freedom and claims. The majority of B. Ed. students viewed child rights as very important for children, and the role of teachers was regarded as very important in safeguarding children, yet expressed a lack of knowledge about this. The awareness of the specific laws for child protection was reported low (except RTE). B. Ed. students reported the incidence of child rights violations, such as corporal punishment in the schools as a normal occurrence.

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10. SAIN (Sonia)
Training and Capacity Building Needs of Field Workers for Creating Awareness about Substance Use among Adolescents in Delhi.
 Supervisor: Prof. (Dr.) Aparna Khanna
Th 27522

Abstract

Substance use is a sensitive issue that is a matter of serious concern in our society, especially among adolescents and youth. This study assessed the training and capacity-building needs of field workers engaged with adolescents and youth in the grassroots communities of Delhi on the issue of substance use. The study aimed to identify the knowledge and skills the field workers required, the challenges they faced, and the support they received while working with adolescents and their caregivers for substance use prevention and recovery. The type of training the field workers had received and/or wished to receive in the future was studied in-depth. The study sample comprised 120 field workers from 25 NGOs in Delhi and 42 specialists in substance use prevention and recovery. A purposive sampling technique was used to select the study sample. The study tools included in-depth interviews and a KAS inventory. Substance use and addiction were rampant problems in grassroots communities and adversely impacted the lives of adolescents, their families, and communities. More than half of the field workers had not received any training to perform their present jobs effectively. They faced several challenges while working with adolescents and youth for substance use awareness. Inadequate knowledge of the harmful effects of substance use, its prevention, treatment, and recovery; communication skills; and community mobilization skills were identified as the core content areas on which field workers required training and capacity-building. The use of interactive training tools and techniques in simple Hindi was expressed by the respondents. The need for regular follow-up training and creating forums for sharing experiences and hand-holding was reported by most respondents. The study recommends the development of a participatory training program with interactive tools for field workers to work effectively to create awareness about the problem of substance use.

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11. SHARMA (Divyansha)
A Study on Innovative Flushable Fragrant Finished Nonwoven Toilet Seat Covers.
 Supervisors: Prof (Dr) Amita Walia and Prof (Dr) Chanchal
Th 27523

Abstract

In India, public washrooms have long been associated with infection risks and unpleasant odours. Addressing this, there's a need for disposable toilet seat covers acting as a protective barrier. To enhance their environmental friendliness, innovations like flushability using cellulosic fibres were explored. The study's primary focus was on sanitation, hygiene, sustainability, and innovation in public washrooms, aiming to improve overall well-being and protect the environment. Market-available nonwoven toilet seat covers exhibited improved performance compared to paper-based ones, in GSM, Thickness, Tensile and Tear Strength. While paper-based toilet seat covers showed high biodegradability, absorbency and flushability. All seat covers lacked inherent antibacterial activity. Spunlaced nonwoven fabrics showed better GSM, Thickness, Tensile and Tear Strength but lacked flushability and antimicrobial properties in 100% Viscose, 100% Polyester and 50%-50% Viscose Polyester. Developing a flushable nonwoven fabric using Viscose and Excel fibres was another objective, with an optimal 50%-50% blend and 30% water-soluble acrylic binder. Extracted Antimicrobial finish using Mango Peels and commercial Fragrant Finish with Lavender essential oil was incorporated at 8% respectively, resulting in improved bacterial reduction, flushability and biodegradability hence meeting the sustainability standards. 100 toilet seat covers were developed based on optimized parameters and given to respondents for feedback. User insights revealed challenges like unhygienic conditions and bad odours, emphasizing the necessity for such products in public spaces. The developed product received positive feedback for its fragrance and performance, boosting user confidence in public washrooms. The study underscores the importance of product innovation and sustainability for manufacturers and industry stakeholders to create efficient and user-friendly disposable toilet seat covers.

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12. SINGH (Priyanka Kumari)
Enzymatic Interesterification and Charaterization of Edible Oil Developed using Perilla Seed Oil and Palmolein.
 Supervisor: Dr. Meenakshi Garg
Th 27524

Abstract

Perilla frutescens L., an underutilized crop in India belonging to the Lamiaceae family, possesses a significant amount of α -linolenic acid (ALA), making it nutritionally valuable. However, its high polyunsaturated fatty acid (PUFA) content limits its application in food applications due to poor oxidative stability. This thesis delves into the challenge by focusing on the preparation of structured lipids (SL) using perilla seed oil (PSO) and Palmolein (PO) using enzymatic interesterification (EIE) and stability enhancement of prepared SL using rosemary bioactive as a natural antioxidant. Optimization of reaction condition was achieved through response surface methodology employing substrate molar ratio of 70:30 (PO:PSO), 8% enzyme concentration (Lipozyme *Thermomyces lanuginosus*) and 6.6 hours of reaction time at 35°C temperature. The SL produced under these conditions had 24.7% of degree of interesterification (DI), 1.5 of MUFA/PUFA ratio, and 0.79 of

omega-6/omega-3 fatty acid ratio resulting in development of SLs abundant in omega-3 fatty acids with altered triacylglycerol composition and enhanced functional properties. Kinetic oxidative stability studies and thermodynamic analysis revealed that among rosemary extract (RE - 500, 1000, 1500ppm) and rosemary essential oil (REO - 0.5, 1, 2%), RE at 1500ppm proved optimal for antioxidant effectiveness. Subsequently, the SL enriched with RE were studied for their thermal properties and accelerated storage shelf-life, demonstrating improved oxidative stability with significant reductions in free fatty acids, peroxide value, p-anisidine value, and conjugated dienes and trienes compared to control samples. Additionally, the addition of RE resulted in the retention of tocopherol and antioxidants in the oil samples. Furthermore, the RE-enriched samples exhibited comparable antioxidant efficacy to BHT at 200 ppm. These findings highlight the potential of EIE in producing and stabilizing omega-3 fatty acid-rich SL with enhanced nutritional and functional properties, while emphasizing RE as a potent strategy for prolonging shelf-life and safeguarding nutritional integrity within the SL.

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