

# Assembly of Higher Education Undergraduate Research



**Assembly of Higher Education: Undergraduate Student Research/Project Posters**

<b>Poster Number</b>	<b>Title</b>	<b>Institution</b>	<b>Student &amp; Advisor</b>
AHE-1	The Effects of Playing Video Games on a Child's Brain	Louisiana Tech University	Genene Carter Advisor: Tonya Vandenbrink
AHE-2	Raising Adolescents: The Concept of "Winners and Losers" Verses the Concept of "Everyone is a Winner"	Louisiana Tech University	Malia Hubbard Advisor: Tonya Vandenbrink
AHE-3	Functional Communication	Louisiana Tech University	Alyssa Pace Advisor: Tonya Vandenbrink
AHE-4	Your Child Won't Say, Make Them Play. The Power of Play Therapy.	Louisiana Tech University	Camdyn Slade Advisor: Tonya Vandenbrink
AHE-5	Market Potentials and Supply Chains of the Cellulosic Handicraft Industry in Kenya	Mississippi State University	Katie Garcia Advisors: Juyoung Lee and Caroline Kobia
AHE-6	The Role of Artificial Intelligence in Weed Detection and Management: A Food Safety Perspective	University of Arkansas at Pine Bluff	Oluwadamilade Ogunbade Advisor: Karleah Harris
AHE-7	Convenience or Nutrition: The Role of Affordable Processed Foods in Student Dietary Choices	University of Arkansas at Pine Bluff	David Opiri Advisor: Jane Opiri
AHE-8	Understanding College Students' Barriers and Motivations in Accessing Food Security Resources	University of Arkansas at Pine Bluff	David Opiri Advisor: Suzette Goldmon

# THE EFFECTS OF PLAYING VIDEO GAMES ON A CHILD'S BRAIN

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## Abstract

With their rising availability and increased marketing toward young children, video games have become a part of many children's daily lives. However, whether or not video games are good for children's brains and overall development remains up for debate. The purpose of this paper is to answer the question: What are the effects of playing video games on a child's brain, and how does the game content and time spent playing influence these effects? One hypothesis was that playing violent video games makes children more aggressive and antisocial and causes attention problems. Another hypothesis was that video games may positively affect children's reaction time and spatial skills. In order to investigate these hypotheses, a review of relevant literature was performed using EBSCO Discovery Service and PubMed. Combinations of the key terms "video games," "children," "cognitive development," "social skills," and "aggression" were used. Fifteen studies from academic journals including the *Journal of the American Medical Association* and the *Proceedings of the National Academy of Sciences* were chosen. From there, the review was narrowed down to ten studies, specifically those that focused on children in middle childhood and those that researched video game usage as opposed to other types of digital media. Each of the authors and their institutions were reviewed to ensure their credibility. The majority of the studies used longitudinal observations to investigate the association between video game play and individual factors such as physical aggression, cognitive performance, and antisocial behavior. Three of the articles focused on aggression, four looked into cognitive performance, one focused on social skills, and two researched a combination of these factors.

After compiling the results of these ten studies, it was found that video games with violent content, such as those rated E10+ (Everyone 10+), T (Teen), or M (Mature), are positively correlated with higher levels of aggression and antisocial behavior in individuals in middle childhood. Additionally, it was found that playing games for more than one to two hours per day exacerbated the negative effects. These findings are consistent with the original hypothesis. On the contrary, some of the studies did find that playing video games increases the speed of children's cognitive functioning as well as attention capacity, which contradicts the hypothesis that gaming would decrease attention span. Some limitations of the studies analyzed include confounding variables that could influence children's aggression, antisocial behaviors, or cognitive performance. Future researchers could conduct studies that take prior behaviors into account or look into mediators and moderators of the behaviors in more depth. Overall, the conclusion reached is that video games are not inherently "bad" for children's brains nor their development, but their impact is largely dependent on the content and time spent playing the game. It is therefore imperative that caregivers and parents set appropriate limits so children are not spending too much of their time gaming and are not playing overly violent games. If families establish consistent routines and set expectations for video game usage, their children will grow up to become a more well-adjusted and successful generation.

This literature review aligns with the Body of Knowledge in several key ways. Firstly, it pertains to *Wellness* by offering insights into the positive and negative effects of video games on aggression, psychological health, and overall well-being. This includes how excessive screen time could affect children physically in areas like vision, posture, and sleep schedule. Secondly, it connects to the *Appropriate Use of Technology* by assessing the suitability of engaging in video games during middle childhood. It looks into how children's social development might be stunted if they are spending more time behind screens than interacting with their peers. Lastly, it ties into *Life Course Development* by exploring how video gaming, as a relatively new social construct, will influence developmental well-being across the lifespan.

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# Raising Adolescents: The Concept of “Winners and Losers” Verses the Concept of “Everyone is a Winner”

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The concept that there are winners and losers in life isn't new, but the idea that everyone is a winner is. The purpose of this literature review is to determine and compare the positives and negatives of raising adolescents, or children aged thirteen through seventeen, with the concept that everyone is a winner or the concept that there are winners and losers. I hypothesize that the concept of being raised by the idea that there are winners and losers will show a more well-adjusted adolescent than one who was raised with the other idea. To answer this question, I have conducted a literature review where I've read thirteen peer-reviewed journal articles and compared their findings. These articles were found by searching through a research database linked with the key word 'adolescents' and other words such as 'will to win', 'participation', 'parenting', or 'childrearing' to name a few. Adolescents and the ways in which to raise them have been compared and studied endlessly, but as new generations become parents, new parenting methods emerge. For several generations, adolescents have been reared to believe that no one is born a winner, and that this particular title must be earned through either work or talent. Therefore, adolescents raised with this more traditional concept that there are winners and losers in life tend to lean more towards competitive and ambitious personality traits that grant the adolescents a grander desire to achieve higher marks in school and in other social situations such as athletics. A drawback though is that these same adolescents are at a higher risk of negative social standing amongst their peers and are in danger of damaging their self-identity and concept when faced with a loss. Slowly but not unnoticeably, newer generations such as Generation Y or even Generation Z have switched parenting approaches. These new ages have begun raising their adolescents with the concept that everyone is a winner regardless of effort. Research has shown these adolescents may enter society, and even school to a lesser extent than society as a whole, with less of a will to succeed or even no drive to do more than the bare minimum but have a more cooperative and idealistic outlook on life, others, and themselves. While both methods have positives and negatives, there is no clear distinction about whether one way in which to raise a child is significantly better than the other. This lack of a clear answer is due to the fact that there are too many variables that go into raising a child such as the family's socio-economic status or education level just to name a couple. Further research comparing these two parenting approaches could greatly benefit future generations. For example, if researchers identify the specific factors contributing to the positive and negative outcomes discussed in this literature review, whether from the "everyone is a winner" approach or the "winners and losers" approach, parents could adopt these beneficial aspects while avoiding those linked to negative effects.

This literature review connects to the Body of Knowledge in several meaningful ways. First, it aligns with *Life Course Development* by highlighting the importance of different parenting types on psychological well-being and social development. This then feeds into *Individual Well-Being* by specifically addressing how this parenting approach influences motivation and social interactions of the adolescent. The concept of everyone is a winner, which is the newest approach to parenting, was contrasted with the previous way of parenting, winner and losers, demonstrating how social development differs across historical times.

## Functional Communication

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Functional communication training (“FCT”) is an approach implemented in Applied Behavior Analysis (“ABA”) therapy to assist autistic individuals in dealing with severe maladaptive behaviors by replacing them with contextually appropriate, alternative behaviors. Maladaptive behaviors are any behaviors that hinder a person’s ability to adapt to life’s daily challenges and oftentimes lead to negative outcomes. FCT focuses on the use of functional communication in order for an individual to express their wants and needs without the presence of maladaptive behaviors. Each time the individual is able to access their want or need through functionally communicating, this response is being reinforced, causing the individual to want to continue using this functional communication rather than the maladaptive behavior that is not being reinforced. The purpose of this literature review is to analyze the effect FCT has on the success rates of ABA therapy. The objective of this literature review is to examine the generalizability and lasting effects this approach has on autistic children in a clinical setting ranging from ages two to six through examining various credible resources. The articles in this literature review come from peer reviewed journals such as *Journal of Applied Behavior Analysis* and *Journal of Behavioral Education*. This literature review was conducted through researching FCT in ABA clinics with autistic children ranging from ages two to six and analyzing the literature found on this topic.

FCT was first introduced to ABA settings in 1985. After this initial introduction, FCT continued to evolve into the popular practice that it is today. In order for FCT to be implemented correctly, specific steps for success need to be addressed. First, therapists need to determine the cause, or function, of the maladaptive behavior through a functional behavior assessment. A functional behavior assessment consists of the therapist observing what occurs before a maladaptive behavior, during the behavior, and after. Through this observation, the therapist is able to determine what is causing this behavior. After this, the therapist must identify an appropriate response that satisfies the cause of the maladaptive behavior. The therapists must then develop a treatment plan which includes reinforcement of functional communication and maladaptive behaviors to not reinforce in order to implement the FCT approach. Therapist’s also need to be sure to include the caregivers of autistic children in their plan to implement FCT in their natural environment. Various research studies agree that if all of these initial steps are met and the treatment plan is implemented correctly, FCT can be highly generalizable and have long lasting effects throughout the life of the child.

Although FCT can be highly generalizable and effective, not everyone uses it or has success with it. There are various reasons for this. For instance, when correctly following the steps of FCT, if a child functionally communicates a want or need, it must be provided immediately in order to reinforce the functional communication. If reinforcement is not provided immediately, maladaptive behaviors will occur. This immediate reinforcement is one of the reasons many turn away from the use of FCT. Reinforcing every need or want a child expresses can be very difficult for the therapist because not all of the child’s wants will be able to be met. Oftentimes this leads to maladaptive behavior from the child which can be difficult for the therapist. Also, the first step of the FCT process is to determine the function of the maladaptive behavior in order to create a functional communicative response. If the function of this

challenging behavior changes then the functional communicative response will also have to change. This constant change of a behavior's function can make it hard for the therapist to keep up with finding different ways for the child to communicate functionally. Additionally, the therapist will have to have a good relationship with the family in order to be able to teach, follow up with, and correct their implementation of FCT. Many times, having a good relationship with the caregivers of clients can be difficult for the therapist. If a good relationship is not created, the FCT plan the therapist creates will not be implemented in the same way by the therapist and the caregiver. This is detrimental to the success of FCT.

Based on the research conducted from peer reviewed articles, the use of FCT for autistic children has positively affected the success rates of ABA therapy. Although there are certain aspects of this intervention that need to be improved, ultimately FCT is beneficial to the success rates of individuals in ABA therapy. However, there is a need for more research. The literature surrounding FCT focuses solely on autistic children that have either benefited greatly or not at all from this intervention. Because the literature focuses on these two vastly different outcomes, there is a need for more research that falls in between. Research with children ages two to six in a clinical setting where the children have benefitted, but still may struggle with functional communication sometimes would be highly beneficial to ABA therapist's understanding and implementation of FCT because it would allow these therapists to look at what implementation strategies work well, which ones don't, and which ones seem to have no real impact.

This literature review connects to the Body of Knowledge in several meaningful ways. First, it aligns with *Basic Human Needs* by highlighting the importance of FCT therapy in improving psychological and physical well-being, promoting overall health and wellness. This then feeds into *Individual Well-Being* by specifically addressing how this therapy can help individuals with autism achieve better mental health outcomes. Additionally, FCT therapy's potential to positively impact individuals across their lifespan ties it to *Life Course Development*. It relates to *Wellness*, as this therapeutic approach is a type of healthcare that emphasizes both psychological health and overall well-being. Lastly, it relates to *Family Strengths* as the family plays a major role in the child's engagement and success in therapy.

## **Your Child Won't Say, Make Them Play. The Power of Play Therapy**

Camdyn Slade, Louisiana Tech University

The purpose of this literature review is to explore the different approaches in play therapy and determine which type of play therapy is most effective. Play therapy is a therapeutic approach that allows children to express themselves through play. Children engage in activities that promote emotional, thought, and experience processing. There are three types of play therapy: the Psychoanalytic approach, the Cognitive-Behavioral approach, and the Child-Centered approach. Each therapeutic approach has its own strengths and limitations in addressing children's emotional and psychological needs. My hypothesis is that child-centered therapy is the most effective approach.

To determine which type of play therapy is the most effective, a review of five pieces of relevant literature was performed. The literature I reviewed included book chapters and peer reviewed research articles over the three types of play therapy. I looked for examples and statistics of the types of play therapy being used in the real world. Validating the titles of those who authored the articles was important as well. When doing my research, it was important to focus on health centers and other articles that included experiment and study results.

In Psychoanalytic Play Therapy (PPT), the goal is for the therapist to help the patient or child to overcome their fears, traumas, anxiety and/or depression by revealing the child to who they truly are and can be. PPT goes past surface layer issues as it delves into unconscious conflicts and past experiences to find the roots of issues and clear the pathways so that the child's healthy development can shine through. PPT focuses on specific difficulties that the therapist aims to get the child to work on; however, these issues are often unconscious for the child (Bromfield, 2003). The goal of PPT is for the child to be resilient and adapt to their surroundings and environment; though, it is proven to be a challenging process for each patient. PPT is a very lengthy process and requires long term engagement, and which can become very costly. This approach to play therapy is rooted in Freud's scientific findings in the psychology field (Bromfield, 2003); however, most of Freud's contributions were far from being scientific. This has led to the thought of Psychoanalytic Play Therapy to be conned. PPT cannot be tested empirically, and it is quite impossible to validate for a few reasons (Broomfield, 2003). First, PPT can be studied but testing its effectiveness poses challenges due to its subjective and long-term nature. Secondly, as PPT is based on the unconscious process and symbolic play which makes it difficult to quantify results using standardized assessments. When using therapy, the goal is to focus on the unconscious and help the patient overcome their struggles, so PPT is an ideal approach to use if the problem of subjectivity and validity was overlooked.

The Child-Centered Play Therapy (CCPT) approach is quite similar to Psychoanalytic Play Therapy in the fact that CCPT aims to understand how the child thinks and feels. However, CCPT prioritizes the child's autonomy and emotional expression, fostering a positive environment. CCPT requires the therapist to build rapport, connect with and provide unconditional positive regard to the child. With Child-Centered Play Therapy's three core elements being congruence, unconditional positive regard, and empathy (Hamlet & Moss, 2020), it reiterates the importance of the child being the main focus. CCPT results in children having less anxiety and depression, improved social skills and self-esteem. The National Institute of

Health released a research study article on the effectiveness of CCPT. The results are as follows, children participating in CCPT had improvements in problem solving with multiple areas: PTSD, self-concept, internalizing, and externalizing. However, most studies showed very little difference in the outcomes (Humble et. al., 2018). In CCPT there are many specific principles aiming for the therapist to accept the child, allow the child to express themselves freely and guide the therapy session at the pace that works best for the child (Axline, 1969). Focus on the therapist, because CCPT is a very intricate and demanding approach to therapy, the therapist needs to have a high skill level to be able to properly interpret play accurately. If a therapist is not properly trained or certified, this can lead to mixed research findings and confusion for the patient and their family. Some cons to this approach include its costly nature, and is an emotional experience for the child as it may bring up traumatic experiences to overcome them. CCPT has many success stories when being used to treat trauma. Children have left this approach to therapy with psychological improvements more often than not (Humble et. al., 2018).

Cognitive-Behavioral Play Therapy (CBPT) is structured and goal oriented, effectively addressing specific behavioral issues. This type of therapy explains how the world works to the child while showing them how to solve and deal with problems. Promoting cognitive development is essential for learning advanced coping skills and using them to express their emotions. This approach focuses mainly on the child's strengths to then identify and change negative behaviors by using their language skills (Knell, 1993). Once these skills are mastered, patients use them to communicate how they feel. Children leave with a sense of mastery and control when they speak in specific situations; although, having patients verbalize their painful emotions can be stressful and cause temporary anxiety at first. CBPT has been proven highly effective in treating anxiety and other mental disorders (Hofmann et. al., 2012). CBPT is a more technical, logical, and short-term view of ideas, which also might not work well because of the fact that each child learns in different ways. Although CBPT calls for regular sessions, this approach can require a time commitment because of the extra work that is recommended outside of the sessions. Because CBPT requires critical thinking, it is crucial that the patient and therapist are both patient and cooperative. When using CBPT, not only does it help the mental state of the child, it also shows them how to deal with real world problems. After dealing with these problems, the child is then able to communicate about it with a sense of control. This approach adds on to the initial idea to what therapy should be.

After completing the research on each of the three approaches, I came to the conclusion that child-centered play therapy is the most effective. CCPT utilizes play, the natural language of children, and it allows for a consistent, safe environment for children to freely express themselves. When comparing CCPT to CBPT, they are both highly effective, but research shows that CCPT is more effective with helping with mental disorders and other emotional struggles. No comparison is needed for PPT as it cannot be tested, therefore impossible to validate. For CCPT, once one finds that certified, skilled, and eager therapist, the only next step is to attend therapy sessions. CCPT trained professionals aim to be patient with the child, monitor their play while allowing them to express themselves in a safe, consistent environment. This results in an emotionally-sound, socially skilled, problem-solving child.

This literature review aligns with the Body of Knowledge in several ways. Firstly, it pertains to *Wellness* by offering insights into the different types of play therapy and their effects on psychological health, and overall well-being. Secondly, it ties into *Life Course Development* by exploring how therapy can influence a child's well-being both developmentally as an individual but also within their family. This topic is also related to *Basic Human* needs such as psychological needs, safety needs, and self-esteem which can all be positively influenced by the assistant of play therapy. This then leads into *Individual Well-being* by emphasizing the importance of a mentally healthy child.

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## Market Potentials and Supply Chains of the Cellulosic Handicraft Industry in Kenya

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**Research Background:** This research proposal concerns the market potentials and supply chains of the cellulosic handicraft industry in Kenya. A trade that started as a means of being resourceful out of necessity has evolved into a popular industry that generates substantial revenue for handicraft producers in many African countries (Thondhlana et al., 2020). For example, Kenya's handicraft revenue totaled approximately \$40 million in 2021, and South Africa generated nearly \$447 million in handicraft revenue in 2018 (Bonner, 2024). Average craft monthly income ranged between \$48 and \$75 in Zimbabwe, Eswatini, and Malawi, which is significant supplemental income for those living in developing countries (Thondhlana et al., 2020). Notably, the cellulosic craft industry accounts for 4% of the global handicrafts industry's revenue, underlining its economic relevance (*Middle East & Africa handicrafts market size & outlook*). Cellulosic fibers, sourced sustainably as crop byproducts or as primary crops like cotton, generate both economic and environmental benefits, enhancing livelihoods for African farmers and adding value to local economies (Allen et al., 2019; Nakiwala, 2022). Other cellulosic fibers include flax, ramie, banana fiber, and bamboo. Tourism serves as a primary catalyst for the expansion and commercialization of the Africa's handicraft industry (Wright, 2008). In South Africa, where tourism is one of the main sources of revenue, handicraft producers have become aware of this growing industry and have begun to increasingly capitalize on tourist demand (Makhitha, 2015). Between 2005 and 2009, the number of South African craft producers grew by nearly 40 %, a trend closely correlated with the tourism sector's expansion (Makhitha, 2015). This growth is attributed to a newfound cultural appreciation for historically African styles as well as a strengthened national identity, while emerging middle class in South Africa further enhances consumer spending on culturally significant and novelty items such as handicrafts (Makhitha, 2015).

**Purpose of the Study:** Despite this growth trajectory, scholars found that there is a substantial gap between craft producers and craft consumers because of a supply chain disconnect which exacerbates a separation between producers and consumers where handicraft producers have limited understanding of consumer demand. Supply chain disconnect is a problem because it prevents the producer from performing to their maximum potential. By lacking information about the market, handicraft producers are selling themselves short. While resource availability and traditional techniques often shape the use of cellulosic fibers for the production of handicraft products in many African countries, the influence of consumers in tourism sectors increasingly directs design choices toward market demands (Pullanikkatil et al., 2021). Due to the availability of information in Kenya, this study's research will be focused on that country. The purpose of this study is to identify supply chain constraints and realize market opportunities that will be presented upon mitigation of these constraints in order to stimulate the economy in otherwise rural and impoverished communities in Kenya. Research up until this point consists of a case study of the Kenyan cellulosic handicraft industry as a methodological framework. As a part of the case study framework, the mixed method theory will be used for content analysis of interviews with stakeholders of the Kenyan cellulosic craft industry and descriptive analysis of the relevant government data. After the analysis, the plan is to create a conceptual model to explore the market potentials and supply chains of the cellulosic handicraft industry to illustrate

the relationship between variables affecting the market potentials and supply chains constraints of the cellulosic handicraft industry. The theory of constraints will be used to evaluate the function and efficiency of the cellulosic handicraft industry in Kenya. The theory of constraints is a philosophical theory used to maximize efficiency in the business model (Mabin & Balderstone, 2020). Its core principle is that an organization may encounter specific constraints or limitations that hinder it from reaching its full potential. By identifying and isolating these constraints, businesses can learn to eliminate them (Şimsit et al., 2014). Once the constraint is effectively managed, the entire system can function at full efficiency. The theory of constraints can be applied to any part of a business model such as production, supply chain, distribution, research and development, and marketing allowing businesses to systematically address bottlenecks and improve overall efficiency (Şimsit et al., 2014; Gupta et al., 2008). Based on the previous literature, this research aims to explore obstacles in the African cellulosic craft industry's supply chains, primarily focused in Kenya, as well as investigate what opportunities there are to mitigate these supply chain problems. Some constraints that have been identified in the supply chain through this research include cellulosic resource depletion, unreliable supplier intermediaries and lack of transparency during the transportation stage, lack of government regulation and insufficient quality standards, and an untrained labor force (Jokia et al., 2021; Kamuiru, 2015; Makhitha, 2015; Redzuan & Aref, 2011). It is expected that mitigating these constraints would allow for greater industrialization of rural communities, greater economic success for handicraft producers, and unique opportunities to earn greater local, regional, and global prestige for the handicraft industry.

**Methodology:** Qualitative data will be collected to gain a better understanding of the research questions at hand. With qualitative data, researchers can accumulate more detailed responses and identify underlying research themes. By generating qualitative responses, a broader scope will be analyzed. Research will be conducted through virtual interviews. Interview participants are individuals chosen for their professional knowledge on the African handicraft industry. Their expertise will be the key deciding factor of their participation. The interviews will be administered through WebEx, a video call platform, and transcribed. A minimum of twelve interviews will be conducted to ensure validity. Upon transcription, the interviews will undergo the coding techniques related to the grounded theory. Participants will be selected through a snowball sampling method that begins with a trusted contact who has connections with the Kenyan cellulosic handicraft industry. A contact has provided researchers with references, and those references will become the first sample. More participants will be found through a snowball sampling method where previous participants recommend people they believe would fit the desired sample characteristics. Selection criteria of the participants consists of professional knowledge of the Kenyan cellulosic handicraft industry. Researchers are looking for professionals with direct experience in Kenya as well as those with expertise in their field. A minimum of 5 years' experience is strongly recommended for selection in this study. Interview participants will also be found through professional platforms like LinkedIn. Connections will be made based on someone's relevance to the industry and professional experience. Some examples of interview questions include, "Are there areas where the African cellulosic handicraft industry's supply chains may be underperforming? If so, what are they?" and "What preventative actions could be taken now to ensure stability in the African cellulosic handicraft industry?" These interview questions have been developed based on the theory of constraints framework (Mabin & Balderstone, 2020). The goal was to formulate questions that coincide with the steps

in the theory of constraints analysis in order to identify valid, repeated issues within the Kenyan cellulosic handicraft industry. Upon data collection, the interview transcriptions will undergo thematic analysis to identify overarching themes between the many interviews (Braun & Clark, 2006). Descriptive analysis will then be performed as a secondary data analysis to identify trends and patterns within the collected data. The mixed method theory will be used to decipher and analyze data collected for the interviews. The grounded theory consists of various levels of qualitative coding procedures that aid to make sense of and identify patterns between large amounts of qualitative data (Deterding & Waters, 2021). This method of data analysis works well when trying to draw conclusions from large qualitative sources such as interviews or focus groups. Using the grounded theory, researchers can theorize underlying answers presented through primary data (Chun et al., 2019). Researchers can draw conclusions from qualitative data by identifying common themes among respondents' answers. Once many respondents' answers have been compared and categorized, their main concerns will be revealed (McCallin, 2003). The mixed method theory is used to systematically combine qualitative and quantitative data (Chen, 2006). Some advantages of using the mixed method theory include a more well-rounded understanding on data, a strong foundation upon which an argument is built, and an increase in validity of research since it passes through multiple channels. Additionally, the mixed method theory can be used in conjunction with other theories to explain qualitative phenomena. For example, qualitative data may form a conclusion that is supported by quantitative circumstances, or vice versa. Quantitative and qualitative data often have a complex relationship that can be explored through the mixed method theory. A well-conducted interview is crucial to the success and validity of qualitative research (Bolderston, 2012). For this study, the grounded theory will be applied to interview analysis. Once all interview data is collected, key terms can be identified per each respondent's answer. After these key terms are highlighted, they can be set aside, and the process repeats by identifying common themes related to a few of the terms. This step allows the researcher to find underlying themes hidden in large quantities of qualitative data where respondents' answers may not always be clear. Upon recognizing general themes of the data, researchers can draw conclusions and use evidence from the interviews to support them.

Triangulation will also be used to verify and validate interview themes. Triangulation is used to describe the process in which multiple qualitative research methods are used to develop an overall understanding of research (Carter, 2014). There are four types of triangulations: method, investigator, theory, and data source (Carter, 2014). Method triangulation concerns the sampling methods, and it involves the use of multiple different methods to cross-reference. For example, researchers may use data from interviews, surveys, and focus groups to arrive at a singular conclusion (Carter, 2014). Investigator triangulation is when two or more researchers participate in the same study. This method allows them to make their own observations and reach their own conclusions, which verifies the data. The addition of different perspectives makes the data more robust. The next method is theory triangulation. This is when the researcher uses different theories when analyzing data, which creates a more well-rounded understanding for the study since they will interpret the research through different angles (Carter, 2014). The final method is data source triangulation, which is where data is collected from many different people to gain different perspectives on a single topic. Researchers may simultaneously sample different individuals, groups, families, and communities to broaden their information and validate their research. Using the theory of constraints as a theoretical framework, this study plans to investigate limitations of the Kenyan cellulosic handicraft industry and determine solutions to mitigate them. It is an industry with much potential due to the abundance of natural cellulosic

resources, and the maturation of this industry could prove to be profitable for Kenya and could lead to the industrialization of its rural, impoverished areas. The purpose of this study is to gain valuable insight from the industry's professionals to explore the profitability and viability of an industry such as the cellulosic handicraft one in Kenya.

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## The Role of Artificial Intelligence in Weed Detection and Management: A Food Safety Perspective

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Managing weeds effectively is a significant challenge in modern agriculture and presents serious risks to food safety (Vasileiou et al., 2024). Weeds reduce agricultural productivity and contribute to food contamination by hosting pests and pathogens, leading to increased reliance on chemical interventions that may leave harmful residues in food products (Partel et al., 2019). Thus, the incorporation of artificial intelligence (AI) into agricultural weed management has transformed traditional methods, allowing for accurate weed detection and control (Monteiro et al., 2021; Wang et al., 2019). AI-based solutions, particularly machine learning, and robotic systems offer innovative ways to address these challenges. Therefore, food safety is crucial for human health and aligns with the principles of Family and Consumer Sciences (FCS) by strengthening food security, promoting public health, and advancing environmental sustainability.

**Purpose:** This study investigates the use of AI technologies to enhance the efficiency, precision, and sustainability of weed detection and management, with a focus on ensuring food safety. It aims to identify the shortcomings of traditional methods and propose AI-driven approaches to improve agricultural practices.

**Objectives or Hypotheses:** 1) To analyze the accuracy and reliability of AI models, including artificial neural networks (ANNs), in predicting optimal weed control periods to support sustainable food safety. 2) To evaluate the efficiency of robotic systems for real-time weed detection and targeted herbicide application, contributing to improved agricultural productivity and food safety. 3) To investigate the environmental, economic, and food safety impacts of adopting AI-driven weed management systems.

**Methods:** The study conducts a systematic review of existing literature on AI-driven weed management systems and their impact on food safety. The databases searched were EBSCO, ProQuest, ScienceDirect, Web of Science, ERIC, and Google Scholar. The selection criteria included studies that focused on AI applications in weed detection, precision agriculture, and food safety. The methodology adheres to Snyder's (2019) guidelines for identifying, analyzing, and evaluating studies related to this research phenomenon.

**Results and Discussion:** The reviewed literature demonstrates that AI-powered weed management technologies offer a revolutionary approach to modern agriculture and food safety. The results from the existing literature showed that ANNs achieved over 95% accuracy in predicting optimal weed control timings. Robotic sprayers effectively reduced herbicide usage by selectively targeting weed patches, achieving 99.5% accuracy in site-specific applications. Ground-based imaging techniques successfully distinguished weeds from crops even under varying light conditions and overlapping growth patterns. These technologies enhance operational efficiency and significantly reduce environmental pollution and costs associated with herbicide usage. Partel et al. (2019) highlighted that AI-driven precision weed management

directly impacts food safety by minimizing chemical residues in food products, reducing contamination risks and improving overall crop quality. Precision application of herbicides through AI-integrated autonomous systems ensures that only targeted weeds receive treatment, lowering the amount of chemicals that enter the food chain (Gonzalez-de-Soto et al., 2016). Future research should prioritize the development of affordable, accessible solutions to facilitate the widespread adoption of these innovations. Our research has the potential to strengthen food safety policy and add valuable insights to the existing literature on AI, weed management, and food safety. This study contributes to the field of FCS by addressing key concerns related to food safety, environmental sustainability, and agricultural efficiency. It also aligned with the FCS body of knowledge's core concepts- well-being and the use of technology.

## Convenience or Nutrition: The Role of Affordable Processed Foods in Student Dietary Choices

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**Purpose:** The affordability of processed foods has become a significant factor influencing the dietary habits of college students, who often prioritize convenience and cost over nutritional value. This trend raises concerns about the long-term health implications and the need for accessible, healthier food options on campuses. This study explored how the affordability of processed foods influences the eating habits of college students, particularly those from lower socioeconomic backgrounds. It examined the relationship between food costs, accessibility, and students' dietary choices, emphasizing the implications for health outcomes and academic performance. The objectives of the study were to investigate the extent to which food affordability affects college students' reliance on processed foods and to analyze the differences in eating habits among students from varying socioeconomic backgrounds.

Additionally, the study assessed the impact of food insecurity on students' nutritional choices and well-being and evaluated the university initiatives aimed at promoting healthier eating habits among students.

**Methods:** A quantitative survey was conducted with 32 college students using a QR-code-based questionnaire. The survey collected demographic information, including indicators of financial aid and financial independence, to assess socioeconomic background. Key questions focused on processed food consumption, perceptions of food affordability, and attitudes toward healthier eating options. The data was analyzed using descriptive statistics to identify trends and correlations between financial constraints and dietary habits.

**Results and Discussion:** The results revealed the following: *Prevalence of Processed Food Consumption:* 66% of students reported consuming processed foods daily or 3–5 times per week. *Financial Influence on Food Choices:* A significant portion of students cited affordability as a major factor in their dietary decisions. Lower-income students consumed more processed foods due to financial constraints and convenience. *Health Implications:* Frequent consumption of processed foods was linked to increased risks of obesity, chronic diseases, and poor academic performance. *University Initiatives:* While some universities offer programs like food pantries and nutritional education, engagement is lower among low-income students due to stigma and logistical challenges. *Nutritional Awareness Gap:* 36% of students lacked awareness of the connection between nutrition and mental health, highlighting the need for better education on healthy eating.

**Summary and Conclusions:** The study emphasized the significant impact of food affordability on students' eating habits, with financial limitations driving higher consumption of processed foods. Addressing food insecurity through policy changes, increasing access to affordable healthy options, and enhancing nutritional education can contribute to better student health outcomes. Proposed solutions include expanding healthy food choices on campus, introducing grab-and-go nutritious meals, and collaborating with local farms to improve fresh food availability. Raising awareness through educational campaigns can further encourage healthier eating behaviors. By tackling these challenges, universities can foster a healthier student population, improving both academic performance and long-term well-being.

## **UNDERSTANDING COLLEGE STUDENTS' BARRIERS AND MOTIVATIONS IN ACCESSING FOOD SECURITY RESOURCES**

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Food insecurity affects nearly 30% of college students, posing risks to their health and academic success. Despite the fact that many institutions provide resources on food security, student engagement is still limited because of a number of challenges. This study looks at students' reasons for participating and the obstacles they encounter while trying to access food security programs. Improving access, lowering stigma, and guaranteeing that students obtain enough nutrition all depend on an understanding of barriers to food security program participation. Resolving these problems can improve academic performance and general well-being.

A quantitative research design was employed using a questionnaire distributed to 62 college students. Data collection focused on student experiences, barriers, and motivations related to food security programs. Descriptive statistics were used to analyze the data. Additionally, real-world experiences teaching children in a mosque and church about nutrition literacy and cooking skills informed this study. The findings revealed that the primary barriers to participation contained lack of time (75%) and lack of awareness (22%) about available programs. Despite these obstacles, students' main motivations were to have a positive influence (63%) and help others (78%)

The study indicates universities should increase awareness, reduce stigma, and promote student-led initiatives that promote engagement in food security programs. Universities should use social media, student organizations, and academic advisors to begin specialized awareness campaigns that will increase student involvement. Additionally, integrating peer-driven outreach programs, leadership roles, and practical nutrition education could inspire students to make healthier choices and encourage a food security culture on campus. Addressing logistical and social barriers while using students' motivations can foster an engaged student body that promotes food security, improving well-being and academic success.