

Introduction/Conceptual Framework

Cooperative Extension services can empower communities by equipping them with the knowledge and resources necessary to enhance their agricultural practices and improve community vitality (Collins, 2012). Extension's role as an entity of land-grant universities is to teach, research, and serve the public (Gavazzi, 2010). This approach emphasizes directly translating research and educational insights into actionable steps for individuals, thereby fostering positive changes. As the socioeconomic landscape and external circumstances evolve, it is imperative for Extension programs to adapt and realign their priorities accordingly (Gould et al., 2014). In addition, tailoring outreach efforts to cater to diverse backgrounds was recommended. Tailoring may include considering demographic variables, geographic location, professional experience, and generation to amplify the positive impact. Extension must remain responsive to the ever-changing needs of society (Baker et al., 2022; Bull et al., 2004) to effectively serve. Extension professionals can better serve these needs through community-university engagement (Bruns et al., 2015) and effective communication (Baker et al., 2022).

By actively engaging with community members and understanding their specific concerns, Extension systems could identify areas for improvement and innovation, ensuring that these services adapt to the dynamic needs and challenges farmers and rural communities face (Baker et al., 2022; King & Baker, 2018). To create public value, it is imperative to engage internal and external partnerships (Harder, 2019) in developing programming to support the future of Extension. Priority programming is a resource that State Extension agencies across the United States use to set goals and expectations for Extension agents and users. Determining priority programming for state Extension agencies is a top concern in service to communities (Harder, 2019). While Extension systems have increased communication brand strategies to raise awareness of Extension and communicate public value, marketing of Extension programming continues to prove challenging, particularly within specific audience segments (McLeod-Morin et al., 2023; Zagonel et al., 2023).

Uses and Gratifications

The Uses and Gratifications (U&G) Theory is an audience-centric approach founded on the premise that individuals can choose the media and information they consume (West & Turner, 2021). Audiences harbor many needs to fulfill, encompassing cognitive, emotional, personal, social, and tension-relief aspects, prompting various information sources to vie for the attention of audience members (West & Turner, 2021). This situation resembles the concerns of faculty members in the King et al. (2023) study, wherein they articulated concerns that Extension clientele might turn to alternative free sources if Extension failed to cater to their requirements. Fundamentally, U&G theory assumes that it is feasible to research audience preferences using a diverse range of methodological approaches (West & Turner, 2021).

Audience Segmentation

The U&G theory and audience segmentation emphasize understanding and catering to the specific needs, preferences, and behaviors of different audience segments. Indeed, comprehending the audience stands as a cornerstone of effective communication, a principle universally applicable across diverse domains, including social marketing (Kotler & Lee, 2016; Wood, 2016), integrated marketing communication (Thorson & Moore, 1996), and the narrative paradigm (West & Turner, 2021). As a vital entity, Extension must align its communication

endeavors with its diverse audiences' specific needs and preferences (Cartmell et al., 2006; King & Baker, 2018). Understanding its audiences is paramount for Extension to deliver its services effectively (Curtis et al., 2012). U&G theory and audience segmentation both recognize the importance of audience-centric approaches in communication and media. U&G theory emphasizes understanding individual motivations for media consumption, while audience segmentation focuses on categorizing and targeting distinct audience segments. Combining these approaches allows organizations to create more tailored and effective communication strategies that meet the diverse needs of their audience. Audience segmentation in Extension, through the lens of U&G theory, converges around five key areas: 1) audience-centered approaches, 2) understanding audience motivations, 3) customized content and communication, 4) efficient resource allocation, and 5) measuring effectiveness.

Audience-Centered Approach

Communication is the lifeblood of Extension's engagement with its target audiences (Chappell, 1990). However, an organization can only achieve effectiveness by deeply understanding these audiences. Brubaker-Nichols et al. (2021) highlighted how an Extension program, lacking a clearly defined audience, faced limitations in achieving targeted behavioral changes, underscoring the significance of audience comprehension. Enhancing branding and marketing efforts depends on precise audience targeting (Brubaker-Nichols et al., 2021). Recognizing that audiences select and respond to communication as individuals is an essential first step in forming effective communication.

Understanding Audience Motivations

The use of the plural form 'audiences' is critical because, as a public organization, Extension's success hinges not only on serving the individuals it currently engages with but also those it has yet to reach, individuals who still wield influence over policy decisions that impact its operations (Hoggett, 2006; Moore, 1995). This endeavor is ongoing, given that Extension's audiences are dynamic, constantly evolving, and necessitating corresponding shifts and adaptations from the organization itself (Labelle & Anderson-Wilk, 2011; Monaghan et al., 2013). Identifying these motivations, U&G, and segmentation approaches help tailor content and communication strategies.

Customized Content and Communication

In a broader sense, audience segmentation is pivotal in enhancing communication strategies (Weiss & Tschirhart, 1994). Extension can better cater to its audience's communication needs by gaining insight into their preferences (Brubaker et al., 2016). Targeted marketing efforts are indispensable for reaching new audience segments (Settle et al., 2019), necessitating the utilization of various communication channels tailored to specific audience segments (Settle et al., 2012). Furthermore, Extension must communicate consistently with its values (Ray et al., 2015), an undertaking complicated by the multifaceted nature of its values and the needs of its audiences. Public organizations, in general, must embody diverse roles for multiple audience segments (Hoggett, 2006; King et al., 2022; King & Baker, 2018; Warner et al., 1996; Wæraas, 2008).

Efficient Resource Allocation

By understanding which needs and motivations drive different audience segments, organizations can allocate resources (time, budget, personnel) more effectively by targeting the segments most important for organizational goals. Agricultural audiences are far from homogenous, as evidenced by prior research highlighting significant variations in how audiences utilize and engage with communication (e.g., King et al., 2021; King & Baker, 2018; Rockers et al., 2020). For instance, distinct demographic groups exhibit diverse patterns of engagement in the food-buying process (e.g., Cockburn-Wooten et al., 2008; Raskind et al., 2017). By recognizing these patterns, Extension can communicate with audience segments most likely to respond to specific messages. This will be increasingly important as Extension systems grow into newer programming areas like health and wellness (Burton et al., 2021). As a public organization, Extension must be judicious in allocating its resources for communication and marketing activities (Settle et al., 2012).

Measuring Effectiveness

Extension occupies a unique position, often referred to as "the best-kept secret" (DeBord, 2007, para. 1). Settle et al. (2017) found that among public organizations, Extension was the least recognized by the general public but enjoyed the highest level of trust among those who were aware of its activities, which has been highlighted in other work with specific state Extension systems (Abrams et al., 2010; Baker et al., 2011). This also aligns with concerns expressed by faculty and staff at land-grant universities, who perceived external audiences as insufficiently informed about Extension's mission and functions (King et al., 2023; Ray et al., 2015).

Purpose and Objectives

This study sought to identify the differences in perceptions of Extension priority programming areas among individuals residing in Maine. Specifically, the study sought to understand priorities for stakeholders related to programming to make targeted communication efforts more effective through audience segmentation. In a broader sense, this study can compare programming needs to other Extension systems while providing a framework for other Extension systems' communicators to evaluate programming needs and segment their audiences for improved strategic communication. The following research objectives guided the study:
RO1: Explore adult professionals' programming priorities, and
RO2: Explore college students' programming priorities.

Methods and Procedures

The research team selected Q-methodology to address the research objectives of this study because of its ability to investigate the perspectives of people who hold different viewpoints on an issue (Stainton Rogers, 1995; Watts & Stenner, 2012). Extension audiences have proven to be effective for Q-methodology due to its depth of understanding of issues at a moment in time (Campbell et al., 2023; Lien et al., 2018). Prior work using Q-sort methods (Cantrell et al., 2024) demonstrated that stakeholders' perceptions of programming vary based on audience segments and past experiences.

In the current study, researchers conducted two separate Q-sorts using the same Q-sets with different Extension-related clientele. Data were collected in two processes: Group 1 (Professionals) was collected in person from Extension partners, employees, and volunteers in a U.S. Extension system in Fall 2023, and Group 2 (Students) representing students in various

colleges in one University within the same state as the Extension system using a virtual Q-sort software during the same period. Prior to each session, the Institutional Review Board (IRB) approved the study, and appropriate IRB guidelines were followed.

In the Q-sort process, participants answered questions about the Q-set (described in the next section) and demographic questions. A panel of experts within the University of Maine Extension system reviewed demographic questions to determine the appropriateness for each audience. For the professionals' group, the participants selected their role in Extension as a multiple-response question with the options of administrator, faculty, government official, educator, volunteer, or other. They shared if they lived in a rural/urban area based on the U.S. Rural Urban Commuting Area (RUCA) codes (USDA. ERS, 2024), gender identity, race, and ethnicity. The student group answered slightly different demographic questions because of their unique characteristics, format, and sampling method. The researchers requested students to share their gender identity, rural/urban area by RUCA code, major, and previous experience with Extension (yes, no, unsure).

Q-Set

Participants in both groups engaged in a Q-sort process utilizing 42 potential Extension programming areas (Harder et al., 2010; Harder et al., 2019; Narine et al., 2020). All 42 potential Extension programming areas were used as a predetermined concourse, forming the 42-item Q-set (Watts & Stenner, 2012). Researchers followed the framework and study design of Cantrell et al. (2024) to ensure the methods were reliable and based on sound Q-sort methodological principles in the specific area of Extension programming. The 42 items of the Q-set were sorted in a physical and virtual board with a range of -5 to +5 and were sorted into a fixed curve of statements in this frequency: 2, 3, 4, 4, 5, 6, 5, 4, 4, 3, 2. Participants sorted the statements with the question "What programming areas are needed in the UMaine Extension System?" from "Least Needed in UMaine Extension" to "Most Needed in the UMaine Extension."

Participants

The professionals' group consisted of 37 participants who completed an in-person focus group about the Extension system's needs and successes, followed by a hands-on paper Q-sort. The heterogeneous P-set for this group included 20 individuals with unique characteristics. Participants were selected for heterogeneity within the professional population based on 1) role in proximity to Extension (administrator, faculty, government official, educator, or volunteer), 2) county demographics, and 3) gender. This data set aligns with the methodologies standards of analyzing at least half of the items included in the Q-set (Watts & Stenner, 2012).

In the student group, fifty-four student participants sat in on a short presentation explaining what Extension is and what UMaine Extension does. Following this presentation, students completed a Q-sort with a virtual software, qmethodsoftware.com. The students' heterogeneous P-set included 29 individuals with unique characteristics. Due to the nature of this inquiry, participants were selected for heterogeneity with a prioritization of 1) county demographics, 2) prior engagement with Extension programming (yes, no, unsure), 3) gender, and 4) college enrolled.

Data Analyses

Data from both groups were analyzed in KADE software with factor analysis using varimax rotation, as recommended by Q-Methodology (Watts & Stenner, 2012) scholars and

previous studies (Cantrell et al., 2024). A principal components analysis with varimax rotation was used to identify four factors within each of the sorts. Professional and student groups led to four distinct factors in each group, which explained 73% of the overall variance within the professional group and 44% of the overall variance of the student group. Factors with Eigenvalues greater than one were retained following the rule posited by Kaiser (Cliff, 1988). Each factor group had at least two significant Q-sort loadings (Watts & Stenner, 2012). Additional factors were calculated but did not reach a significant eigenvalue. Within the professional population, all 20 individuals reached the 0.38 significance level to be included in the analysis (Brown, 1980; Watts & Stenner, 2012). In the student population, 23 of 29 met the significance level (0.38) for one of the three factors, and six sorts did not meet the significance for any of the factors (Brown, 1980; Watts & Stenner, 2012). The minimum threshold to load onto a factor was 0.38 ($2.58 \times 1/\sqrt{\text{number of statements in Q-set}} = 2.58 \times 1/\sqrt{48}$). Once the significant sorts were identified within each factor, statements with significance ($p < 0.01$) were used to interpret the distinct factors for each population. Factors were then ranked based on the amount of variance each factor explained, with the first factor explaining the most variance and the fourth factor explaining the least for each sort. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged and reported in the results section.

Respondents were categorized into subgroups based on their self-reported demographic information, enabling a comprehensive exploration of their differing perspectives and understanding of audience segments as recommended by Q-methodology (Watts & Stenner, 2012). Additionally, results were interpreted based on the categorization framework (people, economy and jobs, and environment) of the 42 programming areas based on (Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020). The results provide information on how to improve current Extension programs and point to areas that should be a priority in the future.

Limitations

The limitations of this study are similar to other qualitative and Q-method studies. Results are not generalizable beyond this particular group of participants; however, results may be transferable to different groups with similar characteristics (Stainton Rogers, 1995). Results of Q-method studies can only identify points of view in a population and are limited to a particular moment in time (Watts & Stenner, 2005).

Since Q methodology focuses on capturing potentially subjective viewpoints, the researchers' perspective can impact the interpretation of participant responses, making positionality particularly important in this research approach (Stainton Rogers, 1995; Watts & Stenner, 2005). Positionality was limited in one way by using a predetermined concourse from previous studies. However, the interpretation of the factors required researcher interpretation. The research team included a mix of students, faculty, and administrators. All were familiar with Extension programming and were paid either full or part-time through land-grant institutions. This philosophical lens may have impacted the importance placed on Extension programming and traditional Extension programming areas. However, researchers come from both conventional agricultural and non-agricultural backgrounds with a wide range of programming interests. Gender and socioeconomic status varied across researchers, offering a critical data interpretation lens. Participant selection was done by the two administrators on the research team. This allowed for an understanding of the Extension system at a higher level but may have biased the sample of adult participants to those already visible across the system. Similarly, the

courses selected for the student sample were selected by the same two administrators, which may have been influenced by selecting faculty who placed importance on the Extension mission. An additional limitation that should be noted is the limited explanation of the variance of the student population, with only 44% explained. While a limitation of this work, the low explained variance also highlights a difference to the professional population with more streamlined perspectives.

Results/Findings

The findings are organized by research objective, and the results of the four factors for programming identified by adult professionals are first reported. This is followed by the student participants' four programming factors. Details are reported for each group's identified factors and the programming subgroups and associated low and high Z scores.

Adult Professionals' Programming Priorities

Factor 1 for Adult Professionals: Youth-Focused Conservatives

The first factor identified in the professional Q-sort had high support for youth development and low support for the environment. We named this factor *Youth-Focused Conservatives* (Table 1). The demographics for Factor 1 were: 3 educators, 2 faculty, 2 staff, 1 administrator, and 1 other; 7 female, 2 male; 4 suburban, 4 rural, 1 urban; all white, no Hispanic.

Table 1

Demographics for the Four Adult Professionals' Factors

Factor No.	Name	Description	Gender	Residency	Race	Hispanic Yes/No	Extension Role
1	Youth-Focused Conservatives	High support for youth development and low support for the environment	7 female 2 male	4 suburban, 4 rural 1 urban	9 white	9 No	3 educators 2 faculty 2 staff 1 admin. 1 Other
2	Prioritizers of Local Government Efficiency	High value on government and community capacity with low support for controlling invasive species	5 female	2 rural 2 urban 1 suburban	5 white	5 No	3 staff 1 faculty 1 admin.
3	Environmental Preservationists	Highly supportive of the environment and low support of economy and jobs	2 female 1 male	2 rural 1 suburban	3 white	3 No	2 volunteers 1 government or nonprofit partner
4	Eco-Humanists	High value on people and environmental issues	2 female 1 male	3 rural	2 white 1 biracial	2 No 1 Yes	1 admin. 1 faculty 1 other

Factor one explained 43% of the variance, with nine defining variables, a composite reliability of 0.97, and an Eigenvalue of 8.56. The highest priorities for this factor were: helping

youth develop leadership, citizenship, and other life skills; teaching healthy relationship skills to teens; strengthening workforce readiness; composting, reducing, and recycling consumer goods; and strengthening the financial well-being of small businesses. The majority of the highest priorities for this factor focused on people and the economy or jobs. The lowest priorities for this factor were: addressing illegal drug abuse; helping households reduce water use; and protecting the marine environment. The majority of the lowest priorities were for the environment (Table 2).

Table 2

Highest And Lowest Priority Areas for Professionals Factor 1: Youth-Focused Conservatives

	Low Z	High Z	Category
Helping youth develop leadership, citizenship, and other life skills		X	People
Teaching healthy relationship skills to teens		X	People
Strengthening workforce readiness		X	Econ. and Jobs
Strengthening the financial well-being of small business		X	Econ. and Jobs
Composting, reducing, and recycling consumer goods		X	Environment
Addressing illegal drug abuse	X		People
Helping households reduce water use	X		Environment
Protecting the marine environment	X		Environment

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

Factor 2 for Adult Professionals: Prioritizers of Local Government Efficiency

Factor 2 placed a high value on government and community capacity with low support around invasive species. We named this factor *Prioritizers of Local Government Efficiency*.

Demographics for this factor were: 3 staff, 1 faculty, and 1 administrator; 5 female; 2 rural, 1 suburban, 2 urban; all white, no Hispanic individuals (Table 1). Factor two explained 13% of the variance, with five defining variables, a composite reliability of 0.95, and an Eigenvalue of 2.62. The highest priority areas of factor two were: promoting economic development; helping youth develop leadership, citizenship, and other life skills; assisting local government with land use decisions; helping households become more energy efficient; building the capacity of community nonprofits; helping urban communities improve their quality of life; strengthening workforce readiness. The majority of the highest priorities for this factor were in economics and jobs. The lowest priorities for factor two were: preserving foods for home use (e.g., canning, dehydrating); preventing suicide; controlling invasive plants; and controlling invasive pests (e.g. animals, insects). More of these were in the environmental area, specifically focused on plant or animal environmental issues (Table 3).

Table 3
Highest And Lowest Priority Areas for Professionals Factor 2: Prioritizers of Local Government Efficiency

	Low Z	High Z	Category
Helping youth develop leadership, citizenship, and other life skills		X	People
Building the capacity of community nonprofits		X	Econ. and Jobs
Helping urban communities improve their quality of life		X	Econ. and Jobs
Promoting economic development		X	Econ. and Jobs
Strengthening workforce readiness		X	Econ. and Jobs
Assisting local government with land use decisions		X	Environment
Helping households become more energy efficient		X	Environment
Preserving foods for home use (e.g. canning, dehydrating)	X		People

	Low Z	High Z	Category
Preventing suicide	X		People
Controlling invasive plants	X		Environment
Controlling invasive pests (e.g. animals, insects)	X		Environment

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

Factor 3 for Adult Professionals: Environmental Preservationists

The third factor was highly supportive of the environment and less supportive of the economy and jobs. We named this factor *Environmental Preservationists*. The demographics were 2 volunteers and 1 government or nonprofit partner; 2 female, 1 male; 2 rural and 1 suburban; all white (Table 1). Factor three explained 11% of the variance, with three defining variables, a composite reliability of 0.92, and an Eigenvalue of 2.13. The highest priorities for this factor were protecting water quality and reducing/recycling consumer goods. The lowest priorities for this factor were related to the economy and jobs, such as promoting economic development, helping urban communities improve their quality of life, and strengthening the financial well-being of small businesses (Table 4).

Table 4

Highest And Lowest Priority Areas for Professionals Factor 3: Environmental Preservationists

	Low Z	High Z	Category
Protecting water quality		X	Environment
Composting, reducing, and recycling consumer goods		X	Environment
Promoting economic development	X		Econ. and Jobs
Helping urban communities improve their quality of life	X		Econ. and Jobs

	Low Z	High Z	Category
Strengthening the financial well-being of small business	X		Econ. and Jobs

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

Factor 4 for Adult Professionals: Eco-Humanists

The fourth factor was concerned with both people and environmental issues. Thus, we named this factor the *Eco-Humanists*. The demographics were 1 administrator, 1 faculty, and 1 other; 2 female, 1 male; all rural; 2 white, 1 biracial, and 1 Hispanic (Table 1). Factor four explained 6% of the variance, with three defining variables, a composite reliability of 0.92, and an Eigenvalue of 1.22. The highest priorities for this factor were issues related to the environment, such as protecting water quality and assisting local government with land use decisions, and those related to people, like addressing alcohol, prescription drugs, illegal drug abuse, and mental health. In contrast, the lowest priorities for this factor were programming areas that cross people and environmental issues but strongly related to family and relationships, such as preserving foods for home use, strengthening couple and/or marital relationships, and helping households conserve energy (Table 5).

Table 5

Highest And Lowest Priority Areas for Professionals Factor 4: Eco-Humanists

	Low Z	High Z	Category
Addressing alcohol abuse		X	People
Addressing prescription drug abuse		X	People
Addressing illegal drug abuse		X	People
Addressing mental health		X	People
Protecting water quality		X	Environment
Assisting local government with land use decisions		X	Environment

	Low Z	High Z	Category
Strengthening couple and/or marital relationships	X		People
Teaching healthy relationship skills to teens	X		People
Preserving foods for home use (e.g. canning, dehydrating)	X		People
Helping households reduce water use	X		Environment
Helping households become more energy efficient	X		Environment

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

College Student Programming Priorities

Factor 1 for Students: Environmental Preservation Purists

The first student factor was highly supportive of protecting the environment and less supportive of developing people. We named this factor *Environmental Preservation Purists*. The demographics were 4 forestry students, 1 engineering, 1 undecided, and 1 business; 4 males, 2 females, and 1 other; 6 rural and 1 city limits; with 3 unsure of Extension involvement, 2 previously involved with Extension, 2 no involvement (Table 6).

Table 6

Demographics for the Four Student Factors

Factor No.	Name	Description	Gender	Residency	Major	Extension Experience Yes/No/Unsure
1	Environmental Preservation Purists	Highly supportive of protecting the environment and less supportive of developing people	4 male 2 female 1 other	6 rural 1 city limits	4 forestry 1 engineering 1 undecided 1 business	3 unsure 2 yes 2 no
2	Pragmatic Community Supporters	High value on government and community capacity with low value on	3 male 1 female 1 other	3 rural 1 downtown 1 urban/outside the city limits	3 business 1 engineering 1 liberal arts	4 no 1 unsure

Factor No.	Name	Description	Gender	Residency	Major	Extension Experience Yes/No/Unsure
		protecting the environment				
3	Human Development Supporters	High value on developing people and families and low value on supporting the environment and farmers	1 male 1 female 1 preferred not to disclose	1 suburban 1 downtown 1 urban/outside the city limits	1 business 1 engineering 1 forestry	2 no 1 yes
4	Green Economy Champions	High support for the environment and the economy	6 males and 2 females	3 suburban 2 rural 2 urban/outside the city limits 1 downtown	3 forestry 2 business 2 engineering 1 undecided	5 no 2 unsure 1 yes

Factor one explained 19% of the variance, with 7 defining variables, a composite reliability of 0.96, and an Eigenvalue of 5.43. The highest priorities for this factor were: preventing suicide; protecting natural habitats and ecosystems; protecting freshwater resources; protecting the coastal environment; composting, reducing, and recycling consumer goods; protecting the marine environment; controlling invasive plants; and Helping households become more energy efficient. The majority of the highest priorities for this factor were in the environment. The lowest priorities for this factor were: helping youth develop citizenship and other life skills; and addressing prescription drug abuse. The only category in this factor's lowest priorities were those focused on people (Table 7).

Table 7

Highest And Lowest Priority Areas for Students Factor 1: Environmental Preservation Purists

	Low Z	High Z	Category
Preventing suicide		X	People
Protecting natural habitats and ecosystems		X	Environment
Protecting freshwater resources		X	Environment
Protecting the coastal environment		X	Environment
Composting, reducing, and recycling consumer goods		X	Environment

	Low Z	High Z	Category
Protecting the marine environment		X	Environment
Controlling invasive plants		X	Environment
Helping households become more energy efficient		X	Environment
Helping youth develop leadership, citizenship, and other life skills	X		People
Addressing prescription drug abuse	X		People

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

Factor 2 for Students: Pragmatic Community Supporters

The second student factor had a high value on government and community capacity with a low value on protecting the environment. We named this factor *Pragmatic Community Supporters*. The demographics were 3 business students, 1 engineering, and 1 liberal arts; 3 males, 1 female, and 1 other; 3 rural, 1 downtown, and 1 outside the city limits; 4 had no involvement previously with Extension and 1 was unsure of involvement (Table 6). Factor two explained 11% of the variance, with 5 defining variables, a composite reliability of 0.95, and an Eigenvalue of 3.31. The highest priorities for this factor were: addressing illegal drug abuse; preventing chronic disease; reducing obesity through educational programs; helping rural communities improve their quality of life; and ensuring safe food handling practices to prevent foodborne illness. The majority of the highest priorities for this factor were categorized into human-centered programming. The lowest priorities for this factor were: protecting air quality; protecting natural habitats and ecosystems; and composting, reducing, and recycling consumer goods. The lowest priorities were around protecting the natural environment (Table 8).

Table 8

Highest and Lowest Priority Areas for Students Factor 2: Pragmatic Community Supporters

	Low Z	High Z	Category
Addressing illegal drug abuse		X	People

	Low Z	High Z	Category
Preventing chronic disease		X	People
Reducing obesity through educational programs		X	People
Helping rural communities improve their quality of life		X	Econ. and Jobs
Ensuring safe food handling practices to prevent foodborne illness		X	Econ. and Jobs
Ensuring individuals have access to affordable healthy food	X		Econ. and Jobs
Protecting air quality	X		Environment
Protecting natural habitats and ecosystems	X		Environment
Composting, reducing, and recycling consumer goods	X		Environment

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

Factor 3 for Students: Human Development Supporters

The third student factor placed a high value on developing people and families and a low value on supporting the environment and farmers. We named this factor *Human Development Supporters*. The demographics were 1 business student, 1 engineering, and 1 forestry; 1 male, 1 female, and 1 preferred not to disclose; 1 suburban, 1 downtown, and 1 outside the city limits; 2 had no involvement in Extension programming, and 1 had involvement (Table 6). Factor three explained 7% of the variance, with 3 defining variables, a composite reliability of 0.92, and an Eigenvalue of 2.14. The highest priorities for this factor were: preventing suicide; teaching healthy relationship skills to teens; strengthening couple and/or marital relationships; addressing illegal drug abuse; building healthy families; preserving foods for home use (e.g., canning, dehydrating); helping first-time homeowners make smart financial decisions; and Strengthening workforce readiness. The majority of the highest priorities for this factor were focused on

supporting individuals and families. The lowest priorities for this factor were: assisting farmers in agricultural production; protecting air quality; protecting the marine environment; and reducing saltwater intrusion. The majority of the lowest priorities were agriculture and natural resource protection (Table 9).

Table 9
Highest and Lowest Priority Areas for Students Factor 3: Human Development Supporters

	Low Z	High Z	Category
Preventing suicide		X	People
Teaching healthy relationship skills to teens		X	People
Strengthening couple and/or marital relationships		X	People
Addressing illegal drug abuse		X	People
Building healthy families		X	People
Preserving foods for home use (e.g. canning, dehydrating)		X	People
Helping first-time homeowners make smart financial decisions		X	Econ. and Jobs
Strengthening workforce readiness		X	Econ. and Jobs
Assisting farmers in agricultural production	X		Econ. and Jobs
Protecting air quality	X		Environment
Protecting the marine environment	X		Environment
Reducing saltwater intrusion	X		Environment

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

Factor 4 for Students: Green Economy Champions

The fourth student factor highly supported the environment and the economy. Thus, we named this factor *Green Economy Champions*. The demographics were by major and 3 forestry, 2 business students, 2 engineering, and 1 undecided; 6 males and 2 females; 3 suburban, 2 rural, 2 urban outside the city limits, and 1 downtown; 5 were not involved in previous Extension programming, 2 were unsure about prior involvement, and 1 had involvement (Table 6). Factor four explained 7% of the variance, with 8 defining variables, a composite reliability of 0.97, and an Eigenvalue of 2.06. The highest priorities for this factor were: promoting economic development, strengthening workforce readiness; strengthening the financial well-being of small businesses; protecting natural habitats and ecosystems; protecting the coastal environment; and assisting local businesses with land use decisions. The majority of the highest priorities for this factor were looking at human dimensions of employment coupled with reducing the impact of human inputs towards environmental degradation. The lowest priorities for this factor were: preserving foods for home use (e.g., canning, dehydrating); helping rural communities improve their quality of life; building the capacity of community nonprofits; and helping households become more energy efficient. The majority of the lowest priorities were focused on personal or independent changes examining households and individuals (Table 10).

Table 10

Highest and Lowest Priority Areas for Students Factor 4: Green Economy Champions

	Low Z	High Z	Category
Promoting economic development		X	Econ. and Jobs
Strengthening workforce readiness		X	Econ. and Jobs
Strengthening the financial well-being of small businesses		X	Econ. and Jobs
Protecting natural habitats and ecosystems		X	Environment
Protecting the coastal environment		X	Environment
Assisting local businesses with land use decisions		X	Environment

	Low Z	High Z	Category
Preserving foods for home use (e.g. canning, dehydrating)	X		People
Helping rural communities improve their quality of life	X		Econ. and Jobs
Building the capacity of community nonprofits	X		Econ. and Jobs
Helping households become more energy efficient	X		Environment

Note. Categories are highlighted in colors to show differentiation visually: People = pink; Economy and jobs = yellow; Environment = green. Categorization framework based on Cantrell et al., 2024; Harder et al., 2019; Narine et al., 2020. High and low Z score determinations were made from the KADE analysis composite sort output, where statistically significant high and low Z scores were flagged.

Discussion/Conclusions/Recommendations

While this study took place within one state Extension system in the U.S., this approach can serve as a model for stakeholder engagement in prioritizing programming areas in other Extension systems across the U.S. where funding is limited and prioritizing programming through stakeholder input is valued. The findings offer valuable input to enhance current Extension programs and highlight areas to improve future prioritization as Extension strives to meet the needs of current and future potential stakeholders. Results also reaffirm (Cartmell et al., 2006; Curtis et al., 2012) that we must consider unique audiences when prioritizing programming and communication strategies to Extension stakeholders as a discipline. This study also confirms the continued need to adjust communication about programming to stakeholders' professional (King & Baker, 2018) and personal needs (Cantrell et al., 2024) and demographics.

Professional Stakeholder Factors

The four factors identified for professionals in this study demonstrate four particular groups of professional stakeholders within the state Extension system. On the surface, the high-priority areas may look different for the first two groups, with Factor 1 placing a high value on youth and a low value on the environment, and the Factor 2 group focused heavily on government and capacity building with a low value on animal and plant invasive species. However, the overlap of high-priority areas for the first two groups is related to the prioritization of youth development and community-based programming. In contrast, issues related to the environment have lower priority unless these areas are related to community, youth, and capacity building. The third factor, comprised of people who do not have a personal economic tie to Extension, represents a viewpoint potentially shared by the public of an environmental focus but a lack of interest in the economy. The fourth factor, which was the only completely rural factor from the study, prioritizes the environment and human capital challenges that may skew to more rural communities.

Student Stakeholder Factors

Within college students, an indicator of interest in where programming should be prioritized mirrors students' academic interest. Within the first factor, the highest major represented was students studying in the school of forestry, which indicated their preference toward environmental and rural issues. The fourth factor had the highest overall interest in the economy priority areas and was made of the highest percentage of business students comparatively. This aligns with previous work that has identified that adult audiences also seek programming related to their specialty (King & Baker, 2018).

As the Extension system prepares to engage future generations of stakeholders, the emphasis on health and wellness programming may hold significant importance. While the Extension Framework for Health and Wellness (Burton et al., 2021) has been established recently, the full integration of these programming areas may not have been uniformly realized across all states and counties. Notably, the programming priorities identified for Factor 2 of students appear to center around issues related to illegal drug abuse and obesity. This particular group of student stakeholders had limited to no prior involvement with Extension activities. If Extension systems aspire to engage new stakeholders effectively, the focus on human dimensions and areas beyond the realms of "traditional" Extension efforts may prove critical. This perspective aligns with previous research that underscores audience segmentation's importance when trying to connect with fresh audiences (Settle et al., 2019).

Recommendations and Implications for Audience Segmentation

This study's results support audience segmentation's importance for Extension systems (Curtis et al., 2012) for both traditional and new audiences. In a world where individuals can create their own news feed cultivated by their interests, Extension must embrace the segmentation of audiences to effectively market Extension based on niche areas of interest. Specifically, results support the five key areas identified in the review of literature: 1) audience-centered approaches, 2) understanding audience motivations, 3) customized content and communication, 4) efficient resource allocation, and 5) measuring effectiveness.

Audience-Centered Approaches

The outcomes from both professional and student programming priorities underscore the importance of precise audience targeting in Extension communication, a perspective consistent with prior research (Brubaker-Nichols et al., 2021). It's worth noting that the priorities varied between professionals and students, as well as among professionals with no economic affiliations with Extension, and those residing and working in rural versus urban or suburban areas within the state. This recommendation for audience-centered approaches that focus on unique demographics aligns with prior work (Cartmell et al., 2006; King & Baker, 2018), which indicates a need to put the audience first when planning and implementing Extension programming and associated marketing efforts.

Understanding Audience Motivations

Results demonstrate a need to understand audience motivations for decisions. For example, college students in this study exhibited limited comprehension of the interconnectedness of various components within community problems. This was evident in a scenario where a factor identified a particular issue as a priority while simultaneously ranking a potential cause of that issue as of lesser importance. For instance, among the first factor of

students, preventing suicide was prioritized significantly higher than addressing illegal drug abuse. Notably, a substantial portion of this group resided in rural areas, suggesting the possibility of distinct health and wellness concerns and a need for tailored health messaging (Baker et al., 2022). These observations could have significant implications for communicating with this specific stakeholder group.

Customized Content and Communication

Participants' factors identified as priorities within this study demonstrate the vast array of personalized interest in programming priorities for Extension. While commonalities exist in the four factors identified in the professional and student groups, there are more differences than commonalities. There is an opportunity for this specific state Extension system to develop unique marketing profiles for factors identified within this study. For instance, content specific to youth development should be highlighted to market programming to the *Youth-Focused Conservatives* factor within the professionals. These efforts should focus on leadership and personal growth rather than environmental education. This concept is supported by previous recommendations for Extension to focus on value-based communication (Ray et al., 2015), which may speak to the target audiences' specific gratifications rather than overwhelming an audience segment by the whole breadth of what Extension is and does.

Efficient Resource Allocation

Opportunities exist for the UMaine Extension system to focus efforts around the eight factors identified across the two groups within this study. Researchers recommend that leadership review the specific needs of audiences identified in this study and compare them to existing programming. The UMaine system can more efficiently allocate resources by partnering with other organizations that provide public value. For example, current Extension programming in this state does not directly focus on mental health, prescription/illegal drug abuse, alcohol abuse, and suicide prevention. However, since these were identified as priorities in one of the professionals' factors and three of the students' factors, there may be an opportunity to share resources with other organizations that provide public resources that already address these issues. Extension could advance the efforts of other organizations while providing needed services for their stakeholders. Moreover, they may be able to offer shared programming. For example, with the student factor of *Human Development Supporters*, Extension could offer a course on preserving foods for home use and include one module or lesson in partnership with another organization that highlights the shared role of working on projects like this while preventing suicide and offering alternatives like this for those struggling with drug abuse.

Results support previous works' identification of variations in how members of these audiences utilize and engage with communication (e.g., King et al., 2021; King & Baker, 2018; Rockers et al., 2020). It is recommended that other Extension systems in the U.S. engage partners to use public resources efficiently, particularly around health and wellness. As different systems identify programming areas for their states through similar processes, they may find opportunities to share resources in similar and/or unique ways.

Measuring Effectiveness

While this study did not directly measure effectiveness, it provides a framework for an audience-segmented communication approach that is different from the current framework used to target audiences based on demographics. It is recommended that UMaine Extension

implement this value-based approach and measure its effectiveness. Similarly, other systems are encouraged to use audience-centered approaches and measure the effectiveness to move beyond a small number of people who know and value Extension (Abrams et al., 2010; Baker et al., 2011; DeBord, 2007; Settle et al., 2017) to grow the effectiveness of Extension systems to reach and provide public value on a broader scale.

Recommendations for Future Research

Future research should build on this work to gain a deeper understanding of the role of audience-centered communication in communicating with Extension's target audiences. It is recommended that other Extension systems in the U.S. engage partners, volunteers, employees, and students within the land-grant system in processes to understand programming needs to support the public value of Extension and enhance audience communication. Future research should research audience segments and programming needs in Extension systems beyond the one we investigated in this study to crack the code for communication of Extension programming at a national level. With data from multiple state Extension systems, we would better understand programming and communication messaging on a larger scale and may be able to compare different types of Extension needs.

Moreover, each Extension system should regularly engage stakeholders with value-based communication efforts and measure the effectiveness of these efforts. While this study focused on Q-methodology and provides a framework for other Extension systems to use this method to identify programming areas to segment audience's values, different methods should also be used in future research to provide a more robust understanding of current and future stakeholders of Extension.

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Appendix A

Programming Areas Included as Items in the Q-set

No.	Statement
1	Preserving farmland
2	Protecting water quality
3	Protecting air quality
4	Ensuring safe food handling practices to prevent foodborne illness
5	Assisting farmers in agricultural production
6	Strengthening the local food system
7	Promoting economic development
8	Ensuring individuals have access to affordable healthy food
9	Helping youth develop leadership, citizenship, and other life skills
10	Getting more adults involved in mentoring youth
11	Reducing obesity through educational programs
12	Helping consumers make healthy food choices
13	Providing physical fitness education
14	Preventing chronic disease
15	Helping rural communities improve their quality of life
16	Assisting local government with land use decisions
17	Helping communities be better prepared for natural disasters
18	Helping households become more energy efficient
19	Building the capacity of community nonprofits
20	Helping urban communities improve their quality of life
21	Assisting local businesses with land use decisions
22	Preserving foods for home use (e.g., canning, dehydrating)
23	Helping first-time homeowners make smart financial decisions
24	Addressing alcohol abuse
25	Addressing prescription drug abuse
26	Addressing illegal drug abuse
27	Addressing mental health
28	Preventing suicide
29	Building healthy families
30	Strengthening couple and/or marital relationships
31	Teaching healthy relationship skills to teens
32	Strengthening workforce readiness
33	Helping households reduce water use
34	Composting, reducing, and recycling consumer goods
35	Strengthening the financial well-being of small businesses

No.	Statement
36	Controlling invasive plants
37	Protecting the coastal environment
38	Protecting freshwater resources (e.g., lakes, rivers, springs, wetlands)
39	Reducing saltwater intrusion
40	Protecting the marine environment
41	Controlling invasive pests (e.g., animals, insects)
42	Protecting natural habitats and ecosystems
