

Community-Led Strategies to Address Alcohol-Related Challenges and Associated Issues

A Summary of the Evidence

Key Messages

- Programs are most effective when they integrate local traditions, values, and languages, creating relevant, meaningful interventions.
- Focusing on resilience, protective factors, and strengths empowers individuals and communities while reducing stigma around alcohol-related harms.
- Interventions led by communities foster trust, cultural alignment, and relevance, driving sustainable outcomes.
- Addressing logistical challenges like transportation, childcare, and food insecurity increases accessibility and participation in programs.
- Ongoing program assessment and adaptability based on community feedback are critical for long-term program success.

Context

The relationship between alcohol consumption and the associated harms is complex. The impacts of harmful drinking at the individual and community levels are significant, and can include physical and mental health issues, motor vehicle collisions, family disruption, abuse, unemployment, and crime (Canadian Institute for Health Information, 2017). Canadians living in rural, remote, and northern regions experience disproportionately higher rates of alcohol-related hospitalizations than their urban counterparts (Canadian Institute for Health Information, 2017).

Recognizing the importance of geographical isolation as a determinant of health, Statistics Canada developed the Index of Remoteness to quantify community isolation based on proximity to service centers. The index categorizes communities into levels of remoteness, ranging from least remote to most remote. While 88% of Canadians live in least or less remote regions, the remaining 12% are spread across Canada's 75% landmass classified as moderately remote, to most remote regions. Notably, over half of those residing in Indigenous communities live in Canada's more or most remote regions (Statistics Canada, 2022).

In Saskatchewan, over 30% of the population resides in rural and remote communities, with 3% of these located in Northern Saskatchewan. Of this northern population, 85% identify as Indigenous (Statistics Canada, 2022, 2023).

Strategies to mitigate alcohol-related harms vary widely across Canada, with provincial and territorial governments responsible for regulating alcohol availability and accessibility. Effective policies and programs must consider the unique challenges faced by rural and remote communities to promote meaningful impact.

Issue

The Saskatchewan Prevention Institute, in collaboration with Saskatchewan’s Northern Alcohol Strategy partners, conducted a survey among northern healthcare and service delivery providers to assess the educational needs related to alcohol harm reduction. The survey revealed that the most requested topic was *how to develop local solutions for alcohol-related problems in the community*. Other areas of interest included understanding the value of Indigenous knowledge, addressing alcohol-related harms through collaborative efforts, and empowering communities to promote responsible alcohol use to prevent Fetal Alcohol Spectrum Disorder (FASD). These findings highlight the need for community-driven, culturally appropriate strategies tailored to the unique challenges faced by northern and remote communities in Saskatchewan.

Methods

A literature search of key resources was conducted to identify relevant studies. Titles and abstracts were screened for relevance, and full-text articles were evaluated for final selection based on predetermined criteria focused on population, intervention, and outcomes. Detailed search terms and strategy can be found in Appendix 1. Artificial Intelligence (ChatGPT) was used to assist with extracting key themes across the selected articles and drafting of the original concepts. AI-assisted thematic analysis was reviewed, validated, and further refined to ensure accuracy and alignment with research objectives.

Results

The literature search identified 600 citations, 6 of which met the inclusion criteria and are summarized individually in Appendix 2. Five key themes emerged across the articles and are summarized in Tables one through five.

Key Theme #1: Culturally Tailored Approaches

Programs are more effective when they align with the specific values, traditions, languages and practices of the target community (Table 1) (Allen et al., 2023; Brown et al., 2024; Lowe et al., 2024; Munro et al., 2022; Skewes et al., 2024; Williams et al., 2024).

Table 1. Key components and examples in the literature of culturally tailored approaches.

Key Components	Examples in the Literature
<ul style="list-style-type: none"> • Traditions, ceremonies, customs and healing practices are incorporated. • Program materials are developed in local languages and use local imagery. • Ceremony and stories of the community are included. • Culturally immersive experiences, specific to that community, are offered (e.g. land-based multi-day camp or day trips). • Culturally tailored approaches should account for historical and intergenerational trauma. Trauma informed practices should be components of interventions (e.g. creating safe space to acknowledge effects of colonialism, systemic inequities) • Goals/healing pathways can range and should be determined by what’s important for the individuals/families in the community (e.g. abstinence, safer drinking, controlled drinking, reduced binge drinking) 	<ul style="list-style-type: none"> • Cultural tailoring not only includes the use of local languages and imagery but also includes meaningful community collaborations in the development of program material. In <i>The Strong Born Campaign (remote communities of Australia)</i>, an FASD awareness campaign, the program engaged Aboriginal and Torres Strait Islander communities in co-designing posters and booklets, incorporating vernacular that resonated culturally, such as terms like “grog” (any alcohol drink) and “yarning” (a conversational process that involves the telling of stories to pass on cultural knowledge) (Williams et al., 2024). • In the Indigenous Recovery Planning program based in American Indian and Alaska Native populations, storytelling and ceremonies to promote healing are incorporated (Skewes et al., 2024) • A Culture as Healing model is used in Canada and incorporates culture-based opportunities to heal (e.g., ceremonies and traditions, storytelling, land-based camps, traditional food gathering, arts and crafts) (Brown et al., 2024).

Key Theme #2: Strength-Based Frameworks

Interventions that highlight protective factors, strengths, and resilience, show more promise than those focused on deficits (Table 2) (Allen et al., 2023; Brown et al., 2024; Lowe et al., 2024; Munro et al., 2022; Skewes et al., 2024; Williams et al., 2024).

Table 2. Key components and examples in the literature of strength-based approaches.

Key Components	Examples in the Literature
<ul style="list-style-type: none"> • Cultural pride and connection are strengths built upon as protective factors that can buffer alcohol risk. • Resilience and community assets are celebrated. • Stigma is reduced by emphasizing potential and progress. • Program events are celebratory and community-oriented (e.g. alcohol-free dances, music festivals, sporting events). 	<ul style="list-style-type: none"> • In rural Alaska, the the <i>Qungasvik</i> (Tools for Life) intervention promoted self-efficiency and readiness for recovery. As part of this initiative, the <i>Yup’ik</i> people – a cultural group indigenous to Alaska - participated in a <i>Maliqianeq</i> (seal hunt) through an adaptation of the <i>Nunam Alulukaakut</i> (The Land Provides for Us) module. This activity emphasized individual protective factors deeply rooted in the <i>Yup’ik</i> worldview, fostering community identity and resilience. By

<ul style="list-style-type: none">• Empowering concepts (e.g. reclaiming autonomy, building self-trust) are emphasized over disempowering concepts (e.g. detoxing, reducing problem behaviors).• Conventional outcome measurements like quantity/frequency of alcohol use are minimized. Instead, positive metrics of program outcomes like readiness for recovery or self-efficacy are favoured.• Individual or community stories of success are highlighted.	<p>integrating cultural practices, the strategy effectively reduced alcohol-related harms while reinforcing the community's sense of self and cohesion (Allen et al., 2023).</p> <ul style="list-style-type: none">• The <i>Strong Born Campaign</i> uses strength-based language in posters, booklets and social media tiles to reduce stigma around the subject of FASD. "Let's make every baby strong born" (Williams et al., 2024).• In Canada, there are over 40 established Managed Alcohol Programs (MAP's), which aim to reduce the harms of heavy, chronic, and street-based illicit drinking through safer moderate alcohol administration. Some indigenous participants (and Indigenous communities) have identified a need for more of these western MAP's to be Indigenous-led and culturally based. They also talk about the qualities of "healing environments". In doing so, they highlight the importance of both a culturally tailored approach to alcohol harm reduction and accessible opportunities for connection to culture to meet their goals. (Brown et al., 2024).• In a culturally tailored harm reduction program, a "Culture as Healing" model is used. This model is rooted in Indigenous philosophies of wellness, emphasizing holistic and strengths-based definitions for healing. Unlike the more than 40 Managed Alcohol Programs (MAPs) established across Canada, which primarily operate in urban settings, using a western worldview and aim to reduce the harms of heavy, chronic drinking, the "Culture as Healing" program promotes healing and recovery by prioritizing holistic well-being, cultural connection, and empowerment (Brown et al., 2024).
--	---

Key Theme #3: Genuine Community Ownership

To ensure trust and relevance, interventions should be led by the community across all phases. Community ownership requires significant investments in time to build trust, capacity, and shared goals (Table 3) (Allen et al., 2023; Lowe et al., 2024; Skewes et al., 2024; Williams et al., 2024).

Table 3. Key components and examples in the literature of community ownership.

Key Components	Examples in the Literature
<ul style="list-style-type: none"> • Local leaders are empowered to design and implement initiatives. This work is done through the establishment of local advisory boards and community partnership committees. Members include elders, knowledge keepers, school personnel, teachers, parents/grandparents. • Input is sought from community members regularly through initiatives like feedback sessions and town hall meetings. • Community members lead intervention initiatives. Training is sought and provided when needed. • A strong emphasis is placed on community trust. • Community-Based Participatory Research (CBPR) frameworks are mentioned repeatedly. • The need for significant investments in time to build community capacity is emphasized. 	<ul style="list-style-type: none"> • The <i>Intertribal Talking Circle</i>, a culturally based intervention tailored to the specific target communities, is significantly more effective for the reduction of alcohol use among very young youth (aged 10-12 years of age) than a standardized non-culturally based intervention (Lowe et al., 2024). • The <i>Indigenous Recovery Planning</i> is an intervention based in American Indian and Alaska Native populations to facilitate recovery (specifically to prevent relapse) from substance use disorders. It is based on a long standing CBPR project that was built over the course of five years. Although the project requires a randomized controlled trial to test for efficacy, a feasibility pilot study suggests that the intervention is feasible to implement and desirable to the community. The development of the intervention is described in a high level of detail with the assertion that the importance of community involvement in this type of intervention and research cannot be overstated (Skewes et al., 2024).

Key Theme #4: Logistical Barrier Reduction to Maximize Accessibility

Logistical and practical barriers to program participation need to be addressed and reassessed periodically to ensure maximum accessibility (Table 4) (Allen et al., 2023; Skewes et al., 2024).

Table 4. Key components and examples in the literature of addressing barriers.

Key Components	Examples in the Literature
<ul style="list-style-type: none"> • The importance of meeting the basic needs of participants is emphasized. • Transportation needs are addressed as part of intervention structure. This is described in various ways including offering transportation to and from programming sessions, 	<ul style="list-style-type: none"> • The <i>Indigenous Recovery Planning</i> based in American Indian and Alaska Native populations provides transportation and meals to program participants. The facilitators of the program place a high value on these elements for several reasons. First, they identified that providing basic needs is key to desirability/acceptability of the

<p>providing a courtesy bus for events where alcohol is served, or using mobile clinics to reach people.</p> <ul style="list-style-type: none"> • The provision of childcare is discussed as fulfilling a logistical need as well as increasing community connection. • Food insecurity is a barrier that, if mitigated, can not only increase participation and improve focus, but can also make interventions more desirable/acceptable. Ways of doing this range from holding program sessions at mealtimes, offering meal services or potlucks as part of (or alongside) the intervention and finding ways to connect programming with community garden initiatives. • Adaptation to accommodate the unique challenges of rural/remote communities is important. • Barriers are identified and practical support is implemented when required. 	<p>intervention. Second, they found that time spent while providing transportation or sharing a meal allowed for further discussions on program content and felt “therapeutic”(Skewes et al., 2024).</p>
--	--

Key Theme #5: Continuous Evaluation and Adaptation

Ongoing evaluation and adaptability are critical for sustainability (Table 5) (Munro et al., 2022; Williams et al., 2024).

Table 5. Key components and examples in the literature of evaluation and adaptation.

Key Components	Examples in the Literature
<ul style="list-style-type: none"> • Community partnerships with researchers are beneficial. Rigorous analytical methods may detect successful program results with higher sensitivity. • Emphasis on creating a set of metrics at an early stage to track quantitative and qualitative changes/outcomes. • More nuanced metrics, especially if developed at an early stage, may help to understand the key change enablers in a community. • Feedback from the community is sought and used to measure impact and refine strategies. • Specific actions mentioned include scheduling regular reviews with community members and holding a 	<ul style="list-style-type: none"> • The <i>Strong Born Campaign</i> used audits (systematic reviews and evaluations of previous campaign materials and strategies) to refine messaging and address overlooked topics. Through this process, it was identified that in previous campaigns the focus was almost exclusively on women’s behavior around alcohol consumption during pregnancy. As a result, adaptations were made to create new, inclusive material such as the “Safe pregnancies are men’s business too” slogan featured on posters and social media tiles (Williams et al., 2024).

<p>“community data” workshop to identify local information sources.</p> <ul style="list-style-type: none">• Audits of past programming can be useful in identifying gaps to inform future programming.• Adaptability is encouraged to meet changing community needs.• Once clear and measurable results are demonstrated, programs can be scaled.	
---	--

Additional Themes

In addition to the five key themes, the reviewed articles highlighted other critical elements of community-led strategies. Programs that integrate traditional cultural practices with modern care methods address physical, mental, emotional, social, and spiritual health emphasizing the interconnectedness of health dimensions (Allen et al., 2023; Lowe et al., 2024; Skewes et al., 2024). The importance of balancing the prevention of harmful alcohol outcomes while supporting those already affected is noted (Williams et al., 2024). Finally, multi-sectoral collaboration, involving partnerships across healthcare, education, housing, and justice sectors, enhances resource efficiency and program impact (Munro et al., 2022; Williams et al., 2024).

Challenges Associated with Community-Led Strategies to Address Alcohol-Related Harms in Remote/Rural Communities

Community-led strategies to address alcohol-related harms face several challenges. Funding for alcohol harm reduction is often limited compared to resources allocated for illicit substance use programs, and local autonomy is limited when the funding authority lies outside of the community (Brown et al., 2024). Evidence-based requirements can conflict with cultural values when treatments developed for non-Indigenous populations fail to address culturally specific risk factors such as historical trauma. Such models often emphasize standardized protocols and short-term outcomes, which contrast with Indigenous priorities of holistic, long-term engagement. This misalignment has led to resistance within American Indian and Alaska Native communities, highlighting the need to adapt evidence-based approaches to integrate Indigenous values and foster trust (Skewes et al., 2024). Additionally, building relationships, training staff, and fostering collaboration requires a significant amount of time before activities can be implemented (Allen et al., 2023). Remote and rural communities struggle with small sample sizes, which limit statistical significance, and the adaptation of evidence-based tools to meet specific-community needs often leaves these tools considered untested (Lowe et al., 2024).

Conclusion

Community-led, culturally grounded programs are essential for reducing alcohol-related harms in rural and remote communities. Success hinges on investing in community leadership, tailoring solutions to local needs, emphasizing strengths while addressing identified barriers. Sustained impact requires ongoing evaluation and continuous adaptation to ensure programs remain relevant, effective, and aligned with community priorities.

References

- Allen, J., Charles, B., Fok, C., Lee, K., Grogan-Kaylor, A., & Rasmus, S. (2023). Culturally grounded strategies for suicide and alcohol risk prevention delivered by rural Alaska Native communities: A dynamic wait-listed design evaluation of the Qungasvik intervention. *Am J Community Psychol*, 71(1-2), 184-197. <https://doi.org/10.1002/ajcp.12621>
- Brown, M., Hunt-Jinnouchi, F., Robinson, J., Clark, N., Mushquash, C., Milaney, K., & Pauly, B. (2024). "Give me the reigns of taking care of myself with a home": Healing environments in an Indigenous-led alcohol harm reduction program. *Harm Reduct J*, 21(1), 177. <https://doi.org/10.1186/s12954-024-01090-y>
- Canadian Institute for Health Information. (2017). *Alcohol Harm in Canada: Examining Hospitalizations Entirely Caused by Alcohol and Strategies to Reduce Alcohol Harm*. <https://www.cihi.ca/sites/default/files/document/report-alcohol-hospitalizations-en-web.pdf>
- Lowe, J., Brooks, J., Lawrence, G., Baldwin, J. A., Kelley, M., & Wimbish-Tompkins, R. (2024). Intertribal Talking Circle for the prevention of alcohol and drug use among Native American youth. *Res Nurs Health*, 47(2), 234-241. <https://doi.org/10.1002/nur.22372>
- Munro, A., Shakeshaft, A., Breen, C., Jones, M., Oldmeadow, C., Allan, J., & Snijder, M. (2022). The impact of Indigenous-led programs on alcohol-related criminal incidents: a multiple baseline design evaluation. *Aust N Z J Public Health*, 46(5), 581-587. <https://doi.org/10.1111/1753-6405.13211>
- Skewes, M., Gonzalez, V., Gameon, J., Ricker, A., Martell, S., Reum, M., & Holder, S. (2024). Development and Feasibility Pilot Study of Indigenous Recovery Planning: A Community-Engaged Approach to Addressing Substance Use in a Native Community. *Clin Psychol Sci*, 12(2), 253-269. <https://doi.org/10.1177/21677026221141662>
- Statistics Canada. (2022). *Population growth in Canada's rural areas, 2016-2021* (Census in Brief, Issue 2021002). <https://www150.statcan.gc.ca/n1/en/catalogue/98-200-X2021002>
- Statistics Canada. (2023). Census of Population. Statistics Canada Catalogue. In *Census Profile*. Ottawa. <https://www12.statcan.gc.ca/census-recensement/2021/dp-pd/prof/index.cfm?Lang=E>
- Williams, R., Hayton, S., Campbell, A., Kemp, H., & Badry, D. (2024). Strong Born-A First of Its Kind National FASD Prevention Campaign in Australia Led by the National Aboriginal Community Controlled Health Organisation (NACCHO) in Collaboration with the Aboriginal Community Controlled Health Organisations (ACCHOs). *Int J Environ Res Public Health*, 21(1). <https://doi.org/10.3390/ijerph21010085>

Appendices

Appendix 1. Detailed Methods

Research Question

What evidence-informed best practices exist for community-led solutions to address alcohol-related issues in rural and remote communities?

Search Strategy

An electronic search of available literature was performed on November 24, 2024, from Medline, PsychInfo and Web of Science. A search filter was applied to retrieve only articles that were published in the English language in Canada, US, Australia, or New Zealand with predetermined selection criteria:

- Population: Indigenous populations (First Nations, Metis, Inuit), in rural and/or remote communities.
- Intervention: Community-led approaches or initiatives
- Outcome: Reduction of alcohol-related issues, including harm, dependency, and excessive drinking behaviors

Search Terms

Ovid MEDLINE(R) ALL <1946 to November 22, 2024>

- 1 Community Participation/ 18920
- 2 exp Community-Based Participatory Research/ 6657
- 3 (communit* adj3 (based or led or design* or approach* or own* or driven or intervention* or prevention*)).mp. 120820
- 4 ((indigenous or first nation* or metis or inuit) adj3 (based or led or design* or own* or driven)).mp. 1246
- 5 or/1-4 138088
- 6 exp Alcohol-Related Disorders/ 124298
- 7 exp Alcohol Drinking/ 80910
- 8 alcoholi*.mp. 190906
- 9 (alcohol* adj3 (harm* or problem* or issue* or related or consump* or dependen*)).mp. 102752
- 10 (drink* adj3 (bing* or problem* or heavy or excess*)).mp. 24924
- 11 or/6-10 297424
- 12 Rural Population/ 72407
- 13 Rural Health/ 24010
- 14 exp Rural Health Services/ 14662
- 15 ((rural or remote) adj3 (communit* or town* or village* or health)).mp. 71408
- 16 exp Indigenous Peoples/ 38053
- 17 (indigenous or first nation* or metis or inuit* or inuk).mp. 60111
- 18 or/16-17 84086
- 19 5 and 11 and 18214

20 limit 19 to english language 213

A focused internet search of grey literature was performed on November 24, 2024.

Selection Criteria

The articles were screened for relevance and eligibility using predefined inclusion and exclusion criteria. To be included, articles must:

- Be published in the English language
- Be conducted in Canada, the United States, Australia or New Zealand
- Examine an intervention involving community-led approaches, and
- Be led by an Indigenous population in a rural and/or remote community

Articles were excluded if they failed to meet any of the inclusion criteria. Grey literature was screened and evaluated using the same inclusion and exclusion criteria as articles sources in databases.

Results

A total of 595 articles were identified in the database search and 5 in the grey literature search, resulting in a total of 600 articles:

- **Ovid MEDLINE(R):** 213 articles retrieved (1946 to November 22, 2024)
- **Ovid APA PsycInfo:** 203 articles retrieved (1987 to November 2024 Week 3)
- **Web of Science Core Collection:** 179 articles retrieved
- **Grey literature:** 5 articles retrieved

After removing 143 duplicates in EndNote, 457 publications remained for title and abstract screening. Of these, 147 full-text publications were retrieved, and 6 citations met the inclusion criteria. The final articles reflect the most recent evidence (2022-2024) and focus on community-led interventions in Indigenous populations in rural and/or remote communities.

Appendix 2. Article Summaries

“Give me the reigns of taking care of myself with a home”: Healing environments in an Indigenous-led alcohol harm reduction program (Brown et al., 2024).

This article explores the experiences of ‘family members’ (program participants) of an Indigenous-led alcohol harm reduction program within the context of culturally supportive housing. With in-depth and semi-structured interviews, it highlights the importance of community driven program design. Three aspects of the program were highlighted as important. First, tailored harm-reduction to shift participants’ relationship with alcohol (moving from survival drinking to having a choice and control). Second, the provision of varied and incremental culture-based

opportunities to heal ("Culture as Healing" model). And lastly, strength-based policies that honour respect and autonomy (contrasted with programs experienced in western spaces).

Culturally grounded strategies for suicide and alcohol risk prevention delivered by rural Alaska Native communities: A dynamic wait-listed design evaluation of the Qungasvik intervention (Allen et al., 2023).

The *Qungasvik* (Tools for Life) intervention, based in rural Alaska, uses a protective factor framework to target suicide and alcohol misuse prevention among youth 12-18 years of age by integrating local cultural values and practices. This article details a multi-site research trial, enabled by a 25-year community based participatory research (CBPR) relationship, examining the effectiveness of the intervention in four rural *Yup-ik* communities. The findings support an Indigenous intervention strategy using a protective factor framework. This highlights the promise of strength-based approaches (as an alternate to clinical pathology-based approaches) for addressing alcohol-related challenges.

The impact of Indigenous-led programs on alcohol-related criminal incidents: a multiple baseline design evaluation (Munro et al., 2022).

The "Breaking the Cycle" program is an aboriginal-led strategy designed to address alcohol-related criminal incidents in Indigenous communities in New South Wales, Australia. The article describes the evaluation of the impact of this program in four separate rural/remote communities. A statistically significant reduction in ARCI's was found in one of the four communities. The results highlight the potential for this type of program, the importance of using rigorous methods in partnership with researchers to evaluate outcomes and the factors that may have contributed to results being demonstrated in only one out of four communities (i.e. range of key priority areas, funding, duration of programming, community exposure to program elements, the extent to which programming is precisely tailored to the community).

Development and Feasibility Pilot Study of Indigenous Recovery Planning: A community-engaged approach to addressing substance use in a native community (Skewes et al., 2024).

The Indigenous Recovery Planning intervention is a culturally grounded program based in a rural American Indian community, designed to facilitate recovery from substance use disorders. It is part of a longstanding CBPR project built on a five-year relationship with academic researchers. Consisting of six weekly sessions, the intervention is a culturally adapted relapse prevention strategy that incorporates a strength-based approach grounded in this community's cultural traditions. This article summarizes results from a feasibility pilot study, with the goal of adjusting for a future clinical trial. The results suggest that the Indigenous Recovery Planning intervention, described in detail, is feasible to implement and is desirable to the community. Plans include conducting a randomized controlled trial to test the program's efficacy and disseminating it in other communities for them to adapt.

Strong Born – A first of its kind National FASD prevention campaign in Australia led by the National Aboriginal Community Controlled Health Organisation (NACCHO) in Collaboration with the Aboriginal Community Controlled Health Organisations (ACCHOs) (Williams et al., 2024).

The "Strong Born" campaign is a first of its kind health promotion campaign based in the Aboriginal and Torres Strait Islander communities of Australia aimed at addressing FASD. This paper describes the process of how the National Aboriginal Community Controlled Health Organisation worked closely with the Aboriginal Community Controlled Health Organisations (ACCHO's) to develop the campaign through co-design. The

materials developed, which were strength-based and culturally tailored, are described. The unique dual focus of campaign activities on prevention of FASD and support for those affected by FASD is highlighted.

Intertribal Talking Circle for the prevention of alcohol and drug use among Native American Youth (Lowe et al., 2024).

The impact of the Intertribal Talking Circle (ITC) program was compared to that of a standard alcohol and drug abuse education (Be a Winner) program for youth 10-12 years of age in three communities in the United States. Findings showed that alcohol and drug use decreased more significantly among those in the ITC program. Additionally, a measure of cultural identity also increased more significantly among ITC participants. The importance of incorporating cultural values and identity into this type of programming is discussed.