

Use of Point-of-Service Systems in School Nutrition Programs: Types, Challenges, and Employee Training

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ABSTRACT

Purpose/Objectives

This study investigated the use of electronic and paper-based point-of-service (POS) systems in school nutrition programs (SNPs), including associated challenges and the desired skills and existing training practices for personnel handling such systems.

Methods

A questionnaire was developed based on interviews with 25 SNP management staff, pilot-tested, and revised. The link to the online questionnaire was emailed to 1,500 SNP directors in 14 states. An additional 500 paper-based questionnaires were mailed to SNP directors in small districts or private/charter schools. Descriptive statistics were summarized using SPSS software.

Results

There were 319 respondents, and 272 used an electronic system only; 22 of them used a paper-based system only; 21 used a combination of electronic and paper-based POS systems; and 4 contained missing data. Technical support from vendors ($n = 221$) was the most important factor for electronic POS system selection. The ability to customize reports ($n = 35$, 10.0%) and interface with district student data management systems ($n = 21$, 6.6%) were indicated as the main challenges. Small school or district size ($n = 29$, 9.1%) was the main reason for using a paper-based POS system. Concerns for paper-based system users pertained to accuracy of reimbursable meal counts ($n = 28$, 8.8%) and time lag in data processing ($n = 27$, 8.5%). Good customer service ($n = 183$, 57.4%) and computer literacy ($n = 160$, 50.2%) were desirable skills for POS handlers. Multiple individuals such as district directors and POS system vendors were involved in providing POS training which varied in frequency, format, and length between small and large districts.

Applications to Child Nutrition Professionals

Electronic POS systems were more prevalent than paper-based systems in SNPs, but challenges existed for both types of systems. School nutrition management staff should consider price, compatibility, functionality, and technical support prior to purchasing a POS system. For SNPs where paper-based POS systems are used, best practices in data management may need to be developed and communicated with directors to improve accuracy of reports. POS training by qualified individuals should be provided regularly to ensure accuracy of transactions and reporting.

Keywords: point-of-Service (POS) system; training; accountability; financial management; reimbursement

INTRODUCTION

The National School Lunch Program (NSLP) and the School Breakfast Program (SBP) are the two largest federally funded food assistance programs. The aim of each is to provide safe, nutritious, and balanced meals to school-age children in the United States (U.S. Department of Agriculture Food and Nutrition Service [USDA FNS], 2013). In 2015 it was estimated that 30.5 million lunches and 14.1 million breakfasts were served daily (USDA FNS, 2016a). Of those, 72.1% of lunches and 85.1% of breakfasts were free or reduced-price (F-RP) meals (USDA FNS, 2016b).

The cost of the NSLP and SBP programs has increased from \$8.6 billion in 1990 to \$16.4 billion in 2014 (Congress of the United States, 2015). This cost increase might be due to changes in demographics, economic status, policy, and the decision to participate by schools or districts (Congress of the United States, 2015). However, there was also evidence showing that some of this increase in cost could be related to payment errors (i.e., certification and non-certification errors) in these programs (USDA FNS, 2007).

Certification errors, which occur when a child is classified into a wrong meal reimbursement category, cost the federal government more than \$1.16 billion for the NSLP and \$336 million for the SBP during the 2012–2013 school year (SY) (USDA FNS, 2015). There are two types of non-certification errors: meal claiming errors and aggregation errors. Meal claiming errors happen when school nutrition staff incorrectly record that a specific meal selection meets the criteria for a reimbursable meal under the NSLP or SBP (USDA, 2012). These meal claiming errors cost nearly \$900 million for the combined SBP and NSLP programs (USDA FNS, 2015).

Aggregation errors can occur (a) at the point of service (POS), (b) while information is transferred from schools to the School Food Authority (SFA), or (c) while information is communicated from the SFA to the state food agency. The cost of POS-related payment errors was \$3 million for the NSLP in the 2012–2013 SY (USDA FNS, 2015), compared to \$26 million reported in the 2005–2006 SY (USDA FNS, 2007). The decrease in this type of payment error was partially due to increased use of electronic systems for recording meal transactions (USDA FNS, 2015).

Electronic POS systems were introduced to SNPs over two decades ago (School Nutrition Association [SNA], 2014). Since this introduction, they have gradually replaced traditional equipment such as cash boxes, cash registers, and manual meal count systems. Electronic POS systems are commonly used to keep track of the number of meals served each day, aggregate the number of meals and generate reports, verify student identity for F-RP meals, and automatically update student accounts. Some of these electronic systems also feature touchscreen terminals and fingerprint recognition technologies that improve the efficiency of operations (Womack, 2011). Conversely, paper-based POS systems are known to be more labor intensive, time-consuming, and prone to transaction errors (Surak & Cawley, 2009). Although it is conceivable that automated POS systems may help SNP staff improve efficiency and reduce common errors, no nationwide investigation of POS system use has been conducted to assess the various aspects of different POS systems.

Training is important to improve efficiency and reduce errors. Different training programs are currently available for SNP staff (Institute of Child Nutrition [ICN], 2016), and previous studies have shown the effectiveness of various training programs in SNPs (Da Cunha, Stedefeldt, & De

Rosso, 2012; Lemons, 2004; Thomson, Tussing-Humphreys, Martin, & Onufrak, 2012). However, little is known about POS system training in SNPs nationwide.

Considering the large government expenditure for SNPs and the significant amount of erroneous payments, an assessment of the current use of POS systems is needed. Therefore, the purpose of this study was to assess POS systems' use in SNPs that do not participate in the Community Eligibility Provision (CEP) for the NSLP and the SBP. Specific research objectives were to (1) describe the activities and operational challenges of electronic and paper-based POS systems, (2) identify desirable skills for employees handling POS systems, and (3) describe the training provided to employees involved in electronic and paper-based POS systems.

METHODS

The study protocol was approved by the Institutional Review Boards at Kansas State University and Auburn University. This study was conducted in two phases: individual interviews and a national survey of SNP management staff. Participants in both phases were selected from 14 states, two states from each of the seven USDA regions with the largest and smallest populations (AK, AL, CA, DE, FL, IL, MN, MO, NM, NY, PA, TX, WY, and VT). The combined population of these states represented 47% of the total U.S. population.

Phase 1: Individual Interviews with State and District-level SNP Directors

Because limited research has been published regarding the use of POS systems in SNPs, individual interviews were conducted to develop the survey instrument. Fourteen directors of state agency child nutrition programs and 25 district-level SNP directors were interviewed to explore a range of activities related to different types of POS systems used in SNPs. Site visits were performed in six schools located in Alabama and Kansas to observe the use of the POS systems. The individual interviews were audio-recorded, transcribed verbatim, organized, and coded independently by two graduate research assistants. The codes were compared and reconciled to reduce redundancy and used to develop common themes for the quantitative survey questionnaire for the national survey in Phase 2.

Phase 2: National Survey of District SNP Directors Across the U.S.

Each director of a state agency child nutrition program provided a list of SNP directors and their contact information for researchers to use when selecting a stratified random sample. Based on the number of NSLP participants in the 14 states, the numbers of individuals to be selected from each state were determined to make up the full sample of 1,500. Because some states had a small number of NSLP participants, individuals from these states were oversampled to ensure response rates.

Research Instrument Development

A questionnaire was developed based on the results of the interviews in Phase 1. The questionnaire contained multiple sections, including demographic information of the participants and school districts (8 items); types, functions, and challenges of the POS systems (5 items); skills of the employees who handle the POS systems (1 item); and training practices for POS system use (4 items). Questions were formulated as multiple choice, ranking, and open-ended varieties.

Once developed, the instrument was reviewed by SNP and foodservice management experts for content validity. To assess usability and the clarity of the instructions and questions, a pilot study was conducted with a convenience sample of 20 SNP directors who were not included in the subsequent study sample. Revisions were made based on the feedback received from the participants, and an online survey using the Qualtrics system was developed along with a paper-based questionnaire. Due to the descriptive nature of the questionnaire, reliability of constructs was not tested or established.

Data Collection and Analysis

An email invitation with a link to the final questionnaire was sent to each of 1,500 district SNP directors in 14 states, followed by two reminder emails to maximize the response rate. To increase the participation of SNP directors in small districts and charter or private schools in which a computer system may not be as readily available, an identical printed questionnaire with a postage-paid self-addressed envelope was also sent to 500 SNP directors selected from the sample, followed by a postcard reminder. Data analyses were conducted using SPSS software (version 23.0). Descriptive statistics included frequencies, means, and standard deviations. Cross-tabulations with Chi-square analyses were used to summarize the data and assess associations between categorical variables.

RESULTS AND DISCUSSION

Findings from the Interviews (Phase 1)

Results from Phase 1 revealed that state agency directors did not require schools participating in the NSLP and SBP to use any particular kind of POS system, nor did they require or endorse any specific electronic systems. Various electronic POS systems were identified, such as Nutrikids, Horizon International Software—OneSource™ Program, PCS Revenue Control Systems, and WebSMART™. District-level directors reported that the size of the school districts, functionality of the systems, and familiarity with a system affected their decisions regarding system selection. Several concerns related to electronic POS systems use were raised such as reporting the reimbursable meal counts in the format requested by the state agency, saving transaction records during a power outage, and communicating with other student data management systems. In general, an Excel spreadsheet was used for data recording in schools that used a paper-based POS system. Some charter schools were not connected to the centralized POS system, and therefore the number of meals served was recorded on a form. The SNP staff then manually entered these figures into the electronic system for meal reconciliation.

Some school districts had more stringent criteria in selecting employees who handled the POS systems (i.e., administering reading and basic mathematics tests to these employees). State and district directors commented that they provided training related to meal pattern, meal counting, and claiming of reimbursement meals. Training specific to POS systems varied among the district-level directors who were being interviewed. District-level directors reported that SNP staff were familiar and comfortable with the use of POS systems.

Demographics of the Respondents

Of the 1,500 individuals who received the invitation to the online or paper-based survey (Phase 2), 319 (21.3%) provided usable responses. Most survey respondents ($n = 277$, 86.8%) were female, and 129 respondents (40.4%) were in the 50- to 59-year-old age group. Almost one-third of the participants ($n = 104$, 32.6%) held a bachelor's degree, and 220 (69.0%) were currently working as a director of an SNP. Thirty-seven percent ($n = 118$) of the respondents had less than

10 years of work experience in SNPs, and another 31.7% ($n = 101$) had worked in SNPs for 11–20 years ($MSD = 16.3 \pm 10.0$ years).

Table 1. Demographic Characteristics of School Nutrition Director Survey Respondents ($N = 319$)

Items	<i>n</i>	<i>%</i>
Gender		
Male	42	13.2
Female	277	86.8
Years		
20 – 29	5	1.6
30 – 39	46	14.4
40 – 49	66	20.7
50 – 59	129	40.4
≥ 60	73	22.9
Degree of education		
High school or GED	35	11.0
Some college	78	24.4
Associate degree	25	7.8
Bachelor's degree	104	32.6
Graduate degree (Master's or doctoral degree)	71	22.3
Other	6	1.9
Current job title		
Director of Child Nutrition Program in a school district	220	69.0
Manager of a Child Nutrition Program of a single school	30	9.4
Coordinator of Child Nutrition Program over several schools	17	5.3
Other	52	16.3
Work experience (years)		
≤ 10	118	37.0
11 – 20	101	31.7
21 – 30	70	21.9
≥ 31	30	9.4
School type^a		
Public	271	85.0
Private	24	7.5
Charter	22	6.9
Other – Alternative	2	0.6
School size (number of students)		
Small (<2,500)	175	54.9
Medium (2,500-19,999)	109	34.2
Large (20,000-39,999)	18	5.6
Mega (≥40,000)	17	5.3

Respondents were from 14 states across the U.S. Those in the Southwest made up the greatest number (29.1%) of the total, followed by respondents from the Western (23.8%), Midwest (12.2%), Northeast (11.6%), Southeast (9.7%), Mid-Atlantic (8.8%), and Mountain Plains (4.8%) regions. A total of 271 respondents worked for public schools (85.0%), and of those, 175 (54.9%) worked for small school districts (student enrollment < 2,500).

Electronic POS Systems: Functions, Selection, and Challenges

Most respondents ($n = 272$, 85.3%) used an electronic POS system, and an additional 21 (6.9%) used a combination of electronic and paper-based systems. The most commonly used software programs included Nutrikids ($n = 95$, 29.8%), WebSMARTT™ ($n = 20$, 6.3%), Skyward® ($n = 20$, 6.3%), Systems Design ($n = 20$, 6.8%), PCS Revenue Management Systems ($n = 19$, 6.0%), and PrimeroEdge ($n = 14$, 4.4%). Respondents who selected “other” indicated they used Aquitas Solutions, Café Enterprise, Infinite Campus, or Meals Plus PowerSchool Connector. Results of the Chi-square analysis showed that small school districts were significantly less likely to use an electronic POS system than large school districts with 2,500 students or more ($\chi^2 = 23.78$, $p < .001$).

Most respondents relied on the electronic POS system to generate a summary of meals served ($n = 277$, 86.8%); manage student account balances and transactions ($n = 276$, 86.5%); identify an applicant’s F-RP meal eligibility status ($n = 248$, 77.7%); interface with the district student-data management system ($n = 233$, 73.0%); transmit sales reports to the district foodservice office ($n = 225$, 70.5%); and generate a detailed summary of each food item sold ($n = 223$, 69.9%). Other common functions of an electronic POS system were randomly selecting 3% of the applications for income verification ($n = 214$, 67.1%) and processing mobile/online payments ($n = 192$, 60.2%).

When deciding which electronic POS system to select, the largest number of respondents ($n = 221$, 69.3%) considered the availability of technical support by the vendors, followed by ease of identifying students ($n = 209$, 65.5%) and training employees ($n = 208$, 65.2%). Challenges with the current electronic POS systems included being unable to customize reports ($n = 35$, 11.0%), difficulty interfacing with the district student-data management system ($n = 21$, 6.6%), and lack of technical support ($n = 14$, 4.4%). Some of the written comments specified frustration with data not being transferred to the following year (i.e., “Data isn’t stored at the end of the year for the next year start-up”) and lack of ways to communicate with parents (i.e., “Cannot send out calls directly to parents for notification of students’ low balances”).

This study showed that 92% of the respondents are currently using an electronic POS system compared to 84% in a previous study (Kavanagh, 2009). Because of advances in computer and internet technology, more SNPs have invested in automated systems to record meal transactions and reduce errors (USDA FNS, 2015). Some of the respondents indicated that they worked with POS providers and made decisions based on their specific needs. The respondents indicated that they learned about POS software by talking with colleagues (i.e., word of mouth) or attending an expo at a national conference where vendors showcased their products.

Respondents stated that a lack of technical support or incompatibility of the system were the biggest challenges with electronic POS systems. Time zone differences may limit the availability of POS providers’ support staff. In some of the school districts, the student-data management system and the electronic POS system were provided by different companies, and therefore part of the student data needed to be entered multiple times into different systems. This process is not only time-consuming but also prone to human error.

Paper-based POS Systems: Selection and Challenges

Twenty-two respondents (6.9%) used only a paper-based POS system in their school districts while an additional 21 respondents used both electronic and paper-based POS systems. Respondents who used the paper-based systems indicated that their district was too small to

invest in an electronic system ($n = 29$). In addition, a lack of funding ($n = 22$) and/or employees who lacked the knowledge and skills to operate an electronic POS system ($n = 20$) also led to such decisions. The three most commonly mentioned challenges for users of paper-based POS systems were difficulty in reporting an accurate reimbursable meal count ($n = 28$), time lag in data processing ($n = 27$), and challenges with handling students' confidential information ($n = 20$).

Table 2. Factors Affecting Electronic POS Systems Selection and Challenges in School Nutrition Programs ($N = 319$)

Items	<i>n</i>	%
Types of POS systems		
Electronic only	272	85.3
Paper-based only	22	6.9
Both electronic and paper-based	21	6.6
Missing data	4	1.2
Factors affecting electronic POS system selection^a		
Technical support from the vendor	221	69.3
Ease of identifying students	209	65.5
Ease of training employees	208	65.2
Ease of charging to student accounts	199	62.4
Affordability (i.e., cost of systems)	197	61.8
Ease of reporting the meal counts to the state agency	192	60.2
Ability to interface with district student data management system	192	60.2
Ability to customize	144	45.1
Previous positive experience or relationships	126	39.5
Cloud-based data storage and transport system	63	19.7
Challenges of using an electronic POS system^b		
Unable to customize reports	35	11.0
Unable to interface with district student data management system	21	6.6
Lack of technical support	14	4.4
Internet (electricity) connection	14	4.4
Lack of important functions	12	3.8
Software update issues	11	3.4
Complicated to use	9	2.8
System glitches	7	2.2
Unable to save information/Not cloud based	7	2.2
Student identification	5	1.6
Payment and price adjustment	5	1.6
F-RP application	4	1.3
Employee training	4	1.3
Inaccurate data	2	0.6
Other	4	1.3

^a This was a multiple response question; therefore the total percentage of responses for this question exceeds 100%.

^b This question was formulated as an open-ended question. The frequency of specific words or phrases provided by the participants was counted. Therefore, “*n*” is less than 319.

Table 3. Reasons and Challenges for Using Paper-based POS Systems in School Nutrition Programs (N = 43^a)

Items	<i>n</i>	% ^b
Reasons for use^c		
School or district is too small to invest in an electronic POS system	29	9.1
Lack of funding	22	6.9
Employee's lack of knowledge and skills	20	6.3
Lack of technical support	16	5.0
Lack of internet connectivity	15	4.7
Other	6	1.9
Challenges of using paper-based system^c		
Reporting accurate number of reimbursable meal counts	28	8.8
Time lag in processing the information/data	27	8.5
Handling confidential information	20	6.3
Systems (POS, district student data management system, state reporting system, etc.) not communicating with one another	15	4.7
Other	5	1.6

^a The total number of responses reflected in this table ($n = 43$) is the sum of response using only paper-based ($n = 22$) and both electronic and paper-based POS systems ($n = 21$).

^b Percentages were calculated based on the total number of respondents ($n = 319$).

^c This was a multiple response question.

In addition to the small size of school districts and limited funding, some school districts received meals through a commissary system, in which the number of meals delivered and served are captured through a meal count form. The challenge of reporting an accurate meal count was consistent with a previous study that showed paper-based POS systems were considered more prone to errors when the information was being transferred between schools and district offices (USDA, 2007).

Desirable Skills for POS Handlers

Good customer service skills ($n = 187$, 58.6%), computer proficiency ($n = 164$, 51.4%), and knowledge about NSLP payment and reimbursement ($n = 154$, 48.3%) were considered the three most important qualifications/skills for POS handlers. Two aspects of the cash handling experience, the ability to count cash accurately ($n = 144$, 45.1%) and the demonstration of strong ethics ($n = 92$, 28.8%), were also important (Table 4).

Good customer service skills (i.e., interpersonal and communication skills) are critical in a workplace, as they are related to job performance (Robles, 2014). These skills are particularly important in the school nutrition environment, where employees are expected to interact with the children and other stakeholders. Employees who are computer literate will be able to master the POS system within a short period of time and with greater accuracy (Sousa & Oz, 2009).

Training Provided to Personnel Involved in Paper-based and Electronic POS Systems

POS system training was usually provided by district directors ($n = 158$, 49.5%), POS system providers ($n = 123$, 38.6%), or another employee who had previously handled the POS system ($n = 111$, 34.8%). Most of the employees were trained on the POS system upon assignment as a

cashier ($n = 225$, 70.5%). On-the-job training was the most common method ($n = 286$, 89.7%). The length of training varied but was generally less than 1 hour ($n = 84$, 26.3%) or between 1 and 2 hours ($n = 84$, 26.3%) (Table 4). Based on Chi-square analysis, off-the-job and stand-alone training was more likely to be conducted in large school districts compared to small school districts ($\chi^2 = 14.62$, $p < .001$).

Table 4. Practices related to POS Training in School Nutrition Programs ($N = 319$)

Items	<i>n</i>	<i>%</i>^a
Most important qualifications and/or skills for POS system handlers^b		
Customer service skill	187	58.6
Computer proficiency	164	51.4
Knowledge about the NSLP payment and reimbursement system	154	48.3
Cash handling experience – accuracy	144	45.1
Cash handling experience – ethics	92	28.8
Previous experience in school nutrition programs	89	27.9
Language skill (English)	28	8.8
Bookkeeping skill	17	5.3
Spanish or other language skill	9	2.8
Person who provided the POS training to employees^b		
School nutrition director	158	49.5
POS system provider	123	38.6
Another employee in the same position who has handled POS systems before	111	34.8
Another child nutrition management staff member in our district	107	33.5
Staff or consultant from the state agency	9	2.8
Other	13	4.1
Frequency of training for staff handling POS systems^b		
When the staff is newly assigned to be a cashier	225	70.5
At the beginning of each academic year	166	52.0
When switching to a new system	98	30.7
At the beginning of each semester	30	9.4
Other (e.g., as needed, depends on review, requested by staff)	24	7.5
Form(s) of POS training employees receive^b		
On-the-job training	286	89.7
Off-the-job, stand-alone training	105	32.9
Off-the-job, part of other training (such as state agency sponsored training)	27	8.5
Estimated length of POS training^c		
Less than 1 hour	84	26.3
1 hour to <2 hours	84	26.3
2 hours to <3 hours	56	17.6
3 hours or longer	74	23.2

^a Percentages were calculated based on total number of respondents ($n = 319$).

^b This was a multiple response question; therefore the total percentage of responses for this question exceeds 100%.

^c Due to missing data, the sum of percentages may not be 100%.

POS training is widely provided in SNPs, which reflects the importance of the POS systems in SNP operations. The prevalence of on-the-job training in an SNP setting was also consistent with

previous research (Lee, Kwon, & Sauer, 2014). Larger school districts provided more off-the-job and stand-alone training compared to small districts, which partly implied the availability of resources and expertise in districts of different sizes (Rushing, Nettles, & Johnson, 2009).

CONCLUSIONS AND APPLICATION

To our knowledge, this is the first study to investigate the use of POS systems in SNPs. Results describe different types of POS systems used in SNPs and their functions and challenges. They also identify desired skills for POS employees and training practices for personnel handling the POS systems.

Because of their versatility and accuracy, electronic POS systems are more common in SNPs than paper-based systems. Electronic POS systems offer a wide range of functions that could allow SNPs to run their operation more efficiently, thereby reducing the amount of manual work that is more prone to human errors (USDA FNS, 2007). The significant decrease in aggregate errors in SNPs from the 2005–2006 SY to the 2012–2013 SY may be due to the increased use of electronic POS systems that recorded the meal transactions and transferred the data more accurately from schools to the SFA and from the SFA to the state food agency (USDA FNS, 2015). Challenges with the electronic POS system arose with customizing reports, interfacing with another system, and receiving timely customer support. Technical support from the vendors was the key factor that influenced electronic POS system selection.

A paper-based system is still a cost-efficient solution for many SNPs that handle a small number of students, are located in rural areas, and have limited infrastructure. In this study, methods were classified as paper-based even when SNP staff members relied on computers (e.g., entering the meal count into an Excel spreadsheet). Paper-based systems were used mainly by small school districts because larger school districts were more likely to afford and equip with technology infrastructure (Rushing et al., 2009). However, paper-based systems raised concerns about the accuracy of the data reported and time lag in data processing. There should be standard operating procedures in SNPs to ensure the data is double-checked by at least two different individuals and that the cross-checking is performed in a timely manner.

Regarding desirable skill levels, customer service was identified as the most important qualification for individuals who operate the electronic POS systems. Computer skills were also critical to ensure data were correctly entered into the system. To maximize the effectiveness of POS systems, SNP directors should select and train employees who can ethically and accurately process transactions and use the system effectively. Among the different types of training methods mentioned by the participants, on-the-job training seems feasible in SNPs, as this method allows employees to be trained within their working environment and become more adept at using a particular POS system (Durham, 2016).

Based on the findings of this research, recommendations are provided for SNPs as well as other stakeholders in SNPs. It is recommended that SNP directors should utilize a form of electronic POS system to minimize errors in recording and transferring meal transactions. The SNP directors may also select a POS system that is cloud based. As mentioned by several directors in Phase 1, a cloud-based system made it possible to access the POS data without geographical limitation, as long as the directors were connected to the internet. The cloud-based solution also allows for routine data backups, which would eliminate some of the concerns about data being

lost in an event of a power outage. To select an electronic or cloud-based POS system that best fits the needs of their school districts, directors should request product demonstrations from POS system vendors. SNP directors could also visit school districts of similar size and structure to compare the POS systems used in other SNPs.

In addition, SNP directors should be educated on how to procure a POS system that meets their needs based on various criteria, such as price, quality, user friendliness, software and hardware capabilities and compatibility, and availability of technical support (Parpal, 2015). Professional organizations such as the SNA may incorporate education sessions relating to the procurement of POS vendors during the annual national conference, to assist SNP management in making an informed decision prior to purchasing a POS system. Furthermore, SNP directors may seek a POS system that allows data integration among different systems (i.e., a student-data management system). Such integration may improve efficiency and confidentiality of information due to reduced double handling of data.

Results from interviews (Phase 1) indicated that there was inconsistent record keeping and reporting among SNP directors who used a paper-based POS system. In general, meal counts are recorded via a roster, log, token, coded ticket, or Excel spreadsheet (Colorado Department of Education [CDE], 2013). The USDA and state agencies may wish to develop a system that can be used in school districts where electronic POS systems are not available so as to increase the efficiency of data collection and reporting.

Customer service and computer skills are desirable for employees who handle POS systems. To attract and retain qualified individuals with both soft and technical skills, SNP administrators may offer competitive compensation packages to their employees. Retirement plans, health benefits, and advancement opportunities are among employment characteristics indicated to be important by personnel in SNPs (DiPietro, 2007).

SNP management should provide regular training on the use of POS systems and ethical handling of information to their employees. The POS users should also be evaluated periodically to assess their proficiency with the system. Future research could measure the outcomes of the training activities by investigating employees' learning (i.e., knowledge, skills, and attitudes), behavior changes (i.e., application of skills) and outcomes (i.e., decrease in errors) (Kirkpatrick & Kirkpatrick, 2009). Because multiple individuals might be in charge of providing POS training, such as directors, managers, and POS providers, a standardized training protocol should be followed to ensure the consistency of the content.

There are several limitations of this study. First, the participants were sampled from 14 states (two from each of seven USDA regions) that represented close to half of the U.S. population. However, certain regions were overrepresented, and others were underrepresented (i.e., the Southeast region), due to variation in response. Specifically, respondents from the Southwest region made up 29.1% of total respondents, while its population comprises only 12.6% of the total population in the U.S. Therefore, the results in these regions should be interpreted with caution. Moreover, results showed that smaller schools were more likely to use paper-based POS systems. While national data indicates that 71.5% of all schools in the U.S. have <2,000 student enrollment (U.S. Department of Education, 2013), only 54.9% participants in this study worked for small districts. Future studies should recruit more participants from smaller school districts to better represent the population.

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