Adult Education Instructional Environments and Interaction Patterns Between Teachers and Students: An ecobehavioural assessment

DARYL MELLARD, DAVID SCANLON, BRENDA KISSAM AND KARI WOODS

Abstract

Researchers who hope to develop improvements to adult basic education have very few quantitative studies on which to base their work. By conducting an ecobehavioural assessment (Greenwood and Carta 1987) of two adult education programs, this study provides empirical data describing two programs that primarily use one-to-one instructional methods. A significant discernible portion of the observations identified lost instructional time – time when teachers were not focused on students, no discernible subject was being instructed, no identifiable materials were being used, and teacher behaviours as well as student behaviours did not correspond to any of the recognised categories related to learning and instruction.

Introduction

Time as such is not what occurs, but what happens during that time.
(Carroll 1989:27)

Many young adults in the US take the General Education Development (GED) test to avoid or overcome the probable consequences of dropping out of high school. These consequences include unemployment, limited earning potential, and dependence on public assistance. Unfortunately, during the last decade less than two-thirds of those attempting the test battery completed all five parts and passed the exam (GED Testing Service 2002). For the hardest to serve populations – young adults who are alienated, or unable or unwilling to learn – GED passing rates are even lower (Dynarski and Gleason 2002). Yet the economic benefits of earning a GED credential are greatest for individuals who drop out of high school with low skills – most likely because they because they increase their human capital by working hard to pass the GED exams, and/or the GED credential signals to potential employers hard-to-observe productive attributes (Tyler 2003).

Adult education above the level of basic literacy instruction in the United States has become, de facto, instruction focused on preparation to pass the GED exams (Tyler 2003). Despite this emphasis researchers and educators hoping to improve learner performance, and thus improve GED passing rates, particularly for the hardest to serve students, have very few quantitative studies describing adult instruction on which to base their work. Therefore, the purpose of this study is to provide empirical data for

understanding characteristics of adult education classroom instruction, especially the interaction patterns or engagement of instructors and learners.

Literature Review

Although quantitative research of adult classroom instruction is limited, such research in K-12 classroom instruction over the past forty years proliferates, and thus provides a framework and language for describing adult instruction. Educational researchers have long understood that time is a key variable in learning (eg. performance measured over time or number of trials, learning curves). The Carroll Model developed in 1963 'expressed the contention that the degree of learning or achievement is a function of the ratio of the time actually spent on learning to the time needed to learn' (Carroll 1989: 26). Hawley and Rosenholtz (1984) reviewed over three thousand studies and concluded that optimising academic learning time is one of the most important factors in improving student achievement.

The amount of time allowed for learning, or opportunity to learn (Carroll 1989), is but one variable influencing student achievement, along with other variables such as students' aptitude, perseverance, ability to understand the instruction, and the quality of instruction. Furthermore, it is not merely elapsed time that creates an opportunity to learn, but more importantly what happens during that time. Because measuring variables such as aptitude, perseverance, and student understanding – which take place inside the mind of a student – is difficult, researchers have devised numerous frameworks and constructs for describing the external variables that are present during formal classroom instruction time. Anderson and Burns (1989), for example, use six components to describe classroom instruction: (a) subject matter, (b) task demands, (c) instructional format, (d) grouping arrangement, (e) time/pacing/coverage, and (f) classroom behaviours and interactions. Weil and Murphy (1982), on the other hand, use five processes to describe instruction: (a) instructional activities, (b) source of instruction, (c) group size, (d) duration, and (e) teacher and student behaviours. Greenwood and Carta (1987) created an instructional environment assessment tool that simultaneously evaluates four ecological events (activity, task, structure, teacher position, and teacher behaviour) and three student behaviours (academic response, task management, and competing or inappropriate responses).

Constructs for understanding instruction abound (eg Gump 1967, Weil and Murphy 1982, Barr, Dreeben and Wiratchal 1983, Greenwood and Carta 1987, Stodolsky 1988, Anderson and Burns 1989, Stigler, Gonzales, Kawanaka, Knoll and Serrano 1999) because studies have shown that several components of instruction have been associated with student achievement (Anderson and Burns 1989). Even so, those associations are not entirely understood, because most studies focus on only one or two major components, often confounding the results. Ecobehavioural assessment

(Greenwood and Carta 1987) is based on the rationale that student performance is largely dependent on the interactions a student has with environmental or ecological factors in the learning environment. Studies using ecobehavioural assessment have made noteworthy contributions to K-12 instructional practices, especially in the instruction of students with significant learning difficulties and barriers (eg encouraging use of instructional methods that promote student engagement and teaching strategies such as class-wide peer tutoring that improve academic achievement [Delquadri, Greenwood, Stretton, and Hall, 1983, Greenwood and Carta 1987, Logan, Bakeman and Keefe 1997]).

Using ecobehavioural assessment, Greenwood and Carta (1987) found that some academic responses of students such as reading aloud, academic talk, and writing are more closely related to achievement than others, such as more passive student responses like just looking at the teacher or independent seat work. They also report on the identification of 'accelerator variables,' or classroom arrangements that increase the academic responding of students, and 'decelerator variables' associated with the low levels of academic responding. Accelerator variables include such things as paper-and-pencil tasks; decelerator variables include arrangements like relatively frequent use of audiovisual media. Being able to identify accelerator and decelerator variables and knowing that 'certain instructional arrangements are accelerators of academic responding' (Greenwood and Carta 1987: 10), enables researches and teachers to modify instruction in ways to lead to greater responsiveness and engagement in daily lessons on the part of students.

The typical ratio of the time spent on learning to the time needed to learn in adult education programs is naturally quite different from that of K-12 schools. Adult education programs have far less time set aside for learning – classroom instruction time – than K-12 schools, and the students are very often individuals who struggle to learn. This critical imbalance prompted us to ask, How is instructional time used in adult eduction? What are the activities, grouping patterns, content emphasis, and duration of instruction? By conducting an ecobehavioural assessment of adult education classrooms, we intend to provide an objective observational measure of instruction and empirical data to serve as valid quantitative indicators for those persons working to improve adult instruction and thus the academic gains of adult learners.

Method

Study Design

We collected data using a modified version of ecobehavioural assessment methods (Carta, Greenwood, Schulte, Arreaga-Mayar, and Terry 1988). Ecobehavioural assessment is based on the rationale that student

performance is largely dependent on the interactions a student has with environmental (that is, ecological) factors in the classroom and is a means of measuring the moment-to-moment effects of program variables (ie teacher behaviours, ecological stimuli) on student behaviour (Greenwood and Carta, 1987, Logan, Bakeman, and Keefe 1997). Our modifications of the observation codes increased the focus on teacher-controlled conditions and behaviours rather than on student behaviours so that we could quantify the frequency of specific instructional behaviours and the amount of time teachers devoted to those instructional behaviours and activities. Therefore, we present out observations in six major categories of classroom ecology: teacher focus, instructional grouping, academic content, materials used, teacher behaviours and student behaviours.

Participants

Programs that prepared adults for the GED were the focus of this adult education study. One of the two participating programs was targeted for invitation because we wished to study GED instruction in an urban setting, and it was the only urban program in the region to offer year-round GED preparation. To expand the initial study, the researchers later invited several adult education centres in the state to participate (a convenient sample population within a 100 mile range for driving purposes) with the intention of studying one urban and one regional suburban/rural program. The first program to accept the invitation was selected. Because the purpose of this study was to describe GED education practices from an ecobehavioural framework for the first time, two centres were considered to be sufficient. Qualification to participate included that a majority of GED educators in a program agreed to participate.

All nine adult education teachers with GED preparation responsibilities at the two adult learning centers agreed to being videotaped in their classrooms during instructional periods. Seven of the teachers were female and two were male. All participating teachers had attained a BA/BS degree; five had completed Master's degrees, and all had taken at least one special education course at the college/university level. The ethnicity of all the teachers was self-identified as White, non-Hispanic.

Setting

The study took place at one urban and one rural-hub adult education centre in a US Midwestern state. The Adult Education (AE) programs at these two sites, which are separated by a distance of 140 miles, physically differ in three distinct ways: (a) the urban Adult Education Center (AEC) is located in a vocational-technical school and the rural-hub comprehensive employment and education training center (CEETC) is located at a community college; (b) the AEC serves an area with a population of over

100,000, and the CEETC serves an area with a population of approximately 8,000; and (c) the AEC had an annual enrolment of 720 adult learners in the study period and the CEETC had an annual enrolment of 191 adult learners.

The urban AEC program is sponsored by the local school district, had recently relocated to an area technical school and follows the procedures and calendar of the school district. AEC staff provides instruction and the GED testing. Learners can receive instruction in adult education classes, English as a Second Language (ESL), and citizenship. The program also has administrative responsibility for adult basic education (ABE) and literacy services in other locations in the community. The AEC offers instruction during the day and a very limited evening program two days per week. Of the seven hundred and twenty students enrolled in the AEC during the study period, 435 (60%) were in adult basic education, 205 (29%) in adult secondary education, and eighty (11%) in ESL.

The rural-hub CEETC is a multifaceted developmental and training centre for a community college and its service area. The faculty offers a varied adult basic education curriculum, including training in literacy, mathematics, and employment skills, as well as assistance and testing to obtain a GED certificate. The community college students and faculty, as well as members of the community, are eligible to receive individualised literacy assessment and instruction. Highly specialised in their content field, the CEETC faculty members offer instruction to individuals with the help of trained tutors and the use of an assortment of training materials and technologies.

Instrument

We selected the MS-CISAR (Mainstream Special Education Version of the Code for Instructional Structure and Student Academic Response) (Carta, et al. 1989) instrument. MS-CISSAR provides ecobehavioural assessment codes that represent a category system under which an observer makes decisions about the code that best describes the target subject's current behaviour.

In order to assess the adult education instructional environment and interactional patterns, we determined that modifications to the MS-CISSAR were needed so that observers focused on teacher rather than student behaviours. As a result of this change in focus, and because the curriculum of adult education centers and the nature of adult learners are different from those of K-12 settings, research staff and the AEC program's instructors jointly revised the codes to ensure content validity. Tables 1, 2 and 3 presents the modified list of categories and codes.

Code	Category	Description
Instructional Group		
1:1=	One-to-one	interacts with only one student
SGI=	Small Group	interacts with two or more students, but not all
WGI=	Whole Group	instructing all students in attendance
Academic Content		
R=	Reading	reading
M=	Math	math
S=	Spelling	spelling
L=	Written language	language
SC=	Science	science
SS=	Social Studies	social studies
PV=	Pre-vocational	prevocational/vocational (specific job skills)
DL=	Daily Living	daily living & community skills, eg. food prep
TN=	Transition	transition, eg. changing between activities
LS=	Learning Strategies	learning strategies
NO=	None	no academic subject
CT=	Can't tell	can't tell, subject undeterminable
Instructional Materials		
RR	Readers	readers, eg. textbooks
WB	Workbooks	workbooks
WS	Worksheets	worksheets
PP	Paper & Pencil	paper and pencil
CP	Computer Work	computer
OM	Other Media	eg. video, music, games, calculator
TE	Testing Materials	testing materials
NM=	No Materials	no materials

Table 1 Modified MS-CISSAR Codes and Categories: Environment

Code	Category	Description
Teacher focus		
S =	Student	Interacts with student(s)
N =	No-one	Interacts with no students, eg, working at desk, talking with another teacher
MT =	Monitoring	Not talking with any student, but is actively moving around to monitor students' work
ST =	Staff	Talking to a staff member or advisor
Teacher Behaviour		
QA =	Question Academic	Asks academic question
QM =	Question Management	Asks management question eg "are all the books open to page 23?"
QD =	Question Discipline	Asks discipline question eg "what is our class rule about…?"
CA =	Command Academic	Makes verbal command cueing an academic response eg "tell me…"
CM =	Command Management	Makes verbal command cueing a management response eg "bring chairs to reading group"
CD =	Command Discipline	Makes verbal command related to discipline ie, social interactions, personal conduct, and school or classroom rules of behaviour
TAT =	Talk Academic	Academic talk
TMT =	Talk Management	Management talk, including encouragement
TDT =	Talk Discipline	Discipline talk
TAR =	Talk Answer	Responds to students' academic questions
TNA =	Talk Non-academic	Non-academic talk eg personal events, lunch
NV =	Non-verbal	Non-verbal prompting cueing student response
AT =	Attention	Looks at, or paying attention to student
RD =	Reading	Reads aloud/in concert with one or more students
FP =	Fetch/Put Away	Fetch/put away materials
WI =	Writing	Writes or marks academic materials, including written prompts to students
TM =	Moves Toward/With	Moves toward/away eg student moving into a group, teacher walking to a student
SD =	Staff Discussion	Staff discussion
NR =	No Response	No response toward class, including grading academic materials

Table 2 Modified MS-CISSAR Codes and Categories: Teacher focus and behaviour

Code	Category	Description
AQ	Academic Question	Asks academic question
TA	Talk Academic	Talks about academic material, including talking to self, peers, and teacher
TM	Talk Management	Talks with a peers about non-academic issues related to academic task eg borrows a pencil
RA	Reading Aloud	Reads aloud
TC	Talk Non-academic	Talk about non-academic/non-management topic
RH	Raising Hand	Raises hands/signals for help
RS	Reading Silently	Reads silently
TP	Task Participation	Participates in academic tasks
CW	Computer Work	Works with computer
W	Writing	Writes or marks materials for academic task, not including drawing
ATT	Attention	Pays attention, looks directly at teacher or peer engaged in related behaviours
AG	Aggression	Aggression
DI	Disruption	Disrupts other students or teachers
NC	Non-compliance	Non-compliance to a teacher directive
SA	Self-abuse	Self-abuse
SST	Self-stimulation	Self-stimulation ie an active and repetitive sensory-motor behaviour
LA	Looking Away	Looks around, away from academic task
MV	Moving	Moves to new area of classroom
NOR	None	None of the above activities

Table 3 Modified MS-CISSAR Codes and Categories: Student behaviour

Procedures

We met with the participating teachers as a group at each site to briefly explain our study and review the revised MS-CISSAR categories. They gave input to final decisions regarding the MS-CISSAR categories that would be used by observers to describe the instructional environment as well as their interactions with students. Thus, teachers were shown the coding system, collaborated to revise the codes, agreed that the coded behaviours would represent ecologically valid interactions and activities, and understood the focus of the study.

Participating teachers were videotaped in their daily instructional routines during a four-week period at the respective sites. The specific dates for videotaping were determined in consultation with the instructors and program administrators in order to minimise conflicts with special events and the video operators' travel expenses. The four urban AEC teachers were taped for sixty minutes each for a total of 1440 ten-second observation intervals. Three of five rural-hub CEETC teachers were taped for sixty minutes each and two were taped for fifty seven minutes each for a total of 1,764 ten-second observation intervals. As both programs offered instruction in one-hour time blocks, we consistently used sixty minutes for a sampling segment. The centres both allowed registered students to drop-in for instruction, knowing that certain instructional topics would be addressed at certain hours and days of the week. Thus, which and how many students would be present could not be predicted in advance.

A video operator placed a video camera on a tripod in the corner of the room to record classroom activity. A single camera was sufficient to capture teacher and student behaviours, and was not distracting to the teachers or students. The teacher wore a remote microphone to ensure the clarity of the sound. During each videotaping session, the video operator filled out a preliminary information form to indicate the teacher, students, academic content, and materials used during the interactions. This form was used later during coding to ensure accuracy of the context of interactions.

Upon entering the adult education classroom, the video operator determined which students had consented to participate in the observations. Any student who had not signed a consent form was informed about the study and was given an opportunity to participate. To participate, students under the age of eighteen had to have their consent form signed by a parent or guardian. If additional students joined the class during the observation, the same procedure was followed to ensure that they were given the opportunity to participate. Taping stopped if the teacher interacted with a student who had opted not to participate. Taping continued when the teacher began working with a participating student.

When all videotaping sessions for a site were complete, project staff compiled separate videotapes for each teacher using a video-editing machine. Audio signals (beeps) were then superimposed on each teacher's videotape using a prerecorded audiotape of beeps. The audio beeps occurred every ten seconds to ensure consistent coding of the observations at fixed intervals.

We developed a coding sheet with the revised MS-CISSAR categories for our observers to complete for each observation interval. Responding to the ten-second interval audio signals (beeps), the observers recorded six categories: (a) instructional grouping, (b) academic content, (c) instructional materials, (d) teacher focus, (e) teacher behaviour, and (f) student behaviour. During intervals in which no interactions between the teacher and a student

occurred, observers recorded the category 'None'. We recorded a total of 1440 intervals for the four AEC teachers and 1764 intervals for the five CEETC teachers.

Reliability

Before the actual coding began, the video coders viewed a sample videotape of instruction in an adult education classroom. Any coding or definitional questions that arose were discussed. After learning the codes, they practised coding the sample videotape and discussed remaining questions. We made appropriate revisions to the definitions of behavioural codes based on the practice sessions.

Two video coders separately viewed and coded a sample of forty eight minutes (or 288 intervals) from four of the nine instructors to establish inter-observer reliability. The results were tallied for both coders separately, and reliability coefficients were calculated for each of the six major categories. For the first four categories, the reliability coefficients were 1.00. For teacher behaviour and student behaviour, the inter-rater reliability coefficients were 0.93 and 0.92, respectively.

Data Analysis

We compiled the data for analysis upon completion of the coding. Analysis consisted of tallying the total number of occurrences of each revised MS-CISSAR category, and calculating the percentage of intervals in which the behaviour or condition described by the category occurred.

Findings

The data collected from the urban and rural-hub adult education programs provide two snapshots of the instructional environment and interaction patterns between teachers and students, which may be informative in developing ways to improve adult education programs. The detailed findings for each of the six major categories are presented in Tables 4, 5 and 6.

Instructional grouping. Instructional groupings coded as None, indicating that the observed activity did not correspond to any of the instructional grouping categories, occurred in forty two percent of the intervals at both sites. The AEC employed One-to-One instructional grouping for the remainder of the intervals (58%). The CEETC utilised One-to-One grouping in forty seven percent of the intervals, Small Groups in eleven percent of the intervals, and Whole Group in less than one percent of the intervals.

	Urban AEC		Rural-hub CEECT	
	Number of Intervals	%of Total Intervals	Number of Intervals	%of Total Intervals
Instructional Grouping				
One-to-One	834	57.9%	829	47.0%
Small Group	0	0.0%	200	11.3%
Whole Group	0	0.0%	1	0.1%
None	606	42.1%	743	41.6%
Total	1440	100.0%	1764	100.0%
Academic Grouping				
Reading	175	12.2%	286	16.2%
Math	354	24.6%	311	17.6%
Science	82	5.7%	0	0.0%
Written Language	176	12.2%	310	17.6%
Can't Tell	34	2.4%	106	6.0%
None	591	41.0%	722	40.9%
Spelling	28	1.9%	0	0.0%
Transition	0	0.0%	17	1.0%
Other	0	0.0%	12	0.7%
Total	1440	100.0%	1764	0.7%
Materials				
Readers	0	0.0%	44	2.5%
Workbooks	308	21.4%	418	23.7%
Worksheets	0	0.0%	9	0.5%
Paper & Pencil	99	6.9%	271	15.4%
Computer	396	27.5%	118	6.7%
Other Media	0	0.0%	2	0.1%
Testing Materials	34	2.4%	89	5.0%
No Materials	1	0.1%	85	4.8%
None	602	41.7%	728	41.3%
Total	1440	100.0%	1764	100.0%

Table 4 Instructional environments

	Urban AEC		Rural-hub CEECT	
	Number of Intervals	%of Total Intervals	Number of Intervals	%of Total Intervals
Teacher Focus				
Student(s)	834	57.9%	1030	58.4%
No-one	500	34.8%	580	32.9%
Monitoring	13	0.9%	4	0.2%
None	5	0.3%	0	0.0%
Staff	88	6.1%	150	8.5%
Total	1440	100.0%	1764	100.0%
Teacher Behaviour				
Question Academic	23	1.6%	24	1.4%
Question Management	12	0.8%	17	1.0%
Talk Academic	250	17.4%	205	11.6%
Talk Management	124	8.6%	231	12.1%
Talk Non-Academic	12	0.8%	27	1.5%
Attention	355	24.7%	376	21.3%
Reading	25	1.7%	94	5.3%
Writing	5	0.3%	20	1.1%
No Response	29	2.0%	217	12.3%
None	547	38.0%	366	20.7%
Staff Discussion	23	1.6%	150	8.5%
Moving Toward/ With Student	13	0.9%	5	0.3%
Other	22	1.6%	32	1.9%
Total	1440	100.0%	1764	100.0%

Table 5 Teacher Focus and behaviour

	Urban AEC		Rural-hub CEECT	
	Number of Intervals	%of Total Intervals	Number of Intervals	%of Total Intervals
Talk Academic	50	3.4%	83	4.7%%
Talk Management	21	1.4%	61	3.4%%
Reading Aloud	58	4.0%	33	1.9%
Talk Non-Academic	4	0.3%	31	1.8%
Reading Silently	12	0.8%	35	2.0%
Computer Work	224	15.6%	36	2.0%
Writing	131	9.1%	96	5.4%
Attention	312	21.7%	626	35.5%
None	612	42.5%	743	42.1%
Other	16	0.3%	20	1.2%
Total	1440	100.0%	1764	100.0%

Table 6 Student behaviour

Academic content. With results similar to those for instructional grouping, engagement with academic content at both sites was coded as None in forty one percent of the intervals. Approximately half the academic content that was observed for both programs was Mathematics, Written Language, and Reading. The AEC teachers were observed teaching Mathematics in twenty five percent of the intervals, Written Language in twelve percent of the intervals, and Reading in twelve percent of the intervals. The CEECT teachers were observed teaching in Mathematics in eighteen percent of the intervals, Written Language in eighteen percent of the intervals, and Reading in sixteen percent of the intervals. The AEC teachers also taught Science in six percent of the intervals and Spelling two percent of the intervals, the CEECT teachers were not observed teaching either of these subjects. Remaining academic content observations predominantly fell under the Can't Tell and Transitions categories. Since the combined percentages for these latter two categories are so small (AEC=2.4% and CEECT=7%), we suggest that the identified content categories adequately represent the AE instructional content coverage at the two sites.

Instructional materials. The most frequently observed category of materials used in both programs was Workbooks – used during twenty

one percent of the intervals in the AEC and in twenty four percent of the intervals in the CEETC. The AEC students were observed using Computers in twenty eight percent of the intervals, while the CEECT students used them in only seven percent of the intervals. Conversely, the CEECT students used Paper and Pencil in fifteen percent of the intervals, while the AEC students used them in only seven percent of the intervals. For the remainder of the intervals, the AEC students used Testing Materials in two percent of the intervals and No Materials in less than one percent of the intervals. The CEETC students used Testing Materials in five percent of the intervals, No Materials in five percent of the intervals, and Worksheets and Other Media in less than one percent of the intervals. Observers categorised materials used in this program as None in forty two percent of the intervals, indicating that no materials were used or that the materials used did not fit any of the MS-CISSAR categories. The former explanation fits better with the observations in the other categories.

Teacher focus. We found that in both the AEC and the CEETC classrooms, teachers focused on one or more students in fifty eight percent of the intervals. Teacher focus was directed to what observers coded as No-one in thirty five percent of the intervals in the AEC and in thirty three percent of the intervals in the CEETC. The AEC teachers also devoted six percent of their focus to other staff and one percent to monitoring students. The CEETC teachers interacted with staff members in eight-point-five percent of the intervals and monitored students in less than one percent of the intervals.

Teacher behaviour. The MS-CISSAR category that provides the most direct observation of teachers' on-task activities in teacher behaviour. Observed teacher behaviour was coded as None in the AEC in thirty eight percent of the intervals and in the CEETC for twenty one percent of the intervals. Teachers paid direct attention to one or more students in the AEC during twenty five percent of the intervals and in CEETC, during twenty one percent of the intervals. The AEC teachers were observed using more academic talk (in 17% of the intervals) than the CEETC teachers (in 12% of the intervals); meanwhile, the CEETC teachers were observed using more management talk (in 13% of the intervals) than the AEC teachers (in 8% of the intervals). The remaining AEC observations were No Response in two percent of the intervals, Reading in one-point-seven percent of the intervals, Staff Discussion in one-point-six percent of the intervals, and Academic Questioning in one-point-six percent of the intervals. Observations in other categories each accounted for less than one percent of the intervals. The CEETC remaining observations were No Response in twelve-point-three percent of the intervals, Staff Discussion in eight-five percent of the intervals, Reading in five-point-three percent of the intervals, Non-academic Talk in one-point-five percent of the intervals,

Academic Questioning in one-point-four percent of the intervals, Writing in one-point-one percent of the intervals, Question Management in one percent of the intervals, and other categories each accounting for observed behaviour in less than one percent of the intervals.

Student behaviour. Students' on-task activities are also important in understanding the ecobehavioural environment of the AE programs. Student behaviour was coded as Attention to the teacher in twenty two percent of the intervals in the AEC and in thirty six percent of the intervals in the CEETC; this meant the student was receiving information from the teacher such as directions, modelling, or an answer to a question. Computer Work was observed in sixteen percent of the intervals in the AEC, while computer based activities was observed in only two percent of the intervals in the CEETC. The AEC students were observed Writing in nine percent of the intervals, Reading Aloud in four percent of the intervals, and engaging in Academic Talk in three percent of the intervals, and in Management Talk in one percent of the intervals. Other categories each accounted for less than one percent of the intervals. The CEETC students were observed Writing in five percent of the intervals, and engaging in Academic Talk in five percent of the intervals, in Management Talk in three percent of the intervals, in Reading Silently in two percent of the intervals, in Reading Aloud in two percent of the intervals, and in Non-academic Talk in two percent of the intervals. Other categories each accounted for less than one percent of the intervals. At both sites forty two percent of the intervals were coded as None, which indicates the observed activity did not correspond to any of the categories.

Relationship between categories. The recurring figures of forty one percent and forty two percent are found in all six categories because observers were consistent in their descriptions of the time periods when no instructional activities were taking place in the learning environments. Specifically, at both sites, teacher focus was on No-one, None or Staff a total forty one percent of the intervals correspondingly, observers found that during those same forty one to forty two percent of intervals instructional grouping was None, materials were None, academic content was None, student behaviour was None, and teacher behaviourwas None, No Response or Staff Discussion.

Discussion

Several observations can be drawn from this study of how instruction time is used in adult education. The amount of time teachers and students spend on actual learning activities, as opposed to management or incidental activities that do not lead to student engagement in processing and acquiring new knowledge or skills, may have important implications for adult education programs. When students are not academically engaged, their opportunities to learn are diminished. Furthermore, the frequency of accelerator and

decelerator activities for student responding observed in the classrooms may be instructive to AE staff. These frequencies could be the basis for discussions on how to improve the time spent in academic engagement.

Overall, the observational data from the two sites were reasonably comparable, suggesting that instructional activities of these two adult education programs are similar in spite of differences in their physical environments (eg sponsoring program, population served, enrolment size). For example, the teachers at both sites engaged students in verbal interaction with Management Questions or Academic Talk during about twenty nine percent of the intervals. Likewise verbal interactions initiated by students differed little between the sites. These findings are consistent with those reported by Thurlow, Ysseldyke, and Garden (1982) and by Sirotnik (1983), who stated that, generally, external differences across schools do not affect teaching practices.

Perhaps the most important similarity between the environments and interactions at the study sites was that neither demonstrated academically engaged behaviours by either teachers or learners occurring in more than sixty percent of intervals. This finding has serious implications for adult learners. Wang's (1998) study of the relationship between students' opportunity to learn and science achievement at the middle school level found that content exposure (the amount of time devoted to a certain subject area, amount of time in class periods, academically engaged time, and instructional time) was the most significant predictor on the written portion of science achievement test scores. Wang went on to state, 'students need to be exposed to the materials for a reasonable amount of time for them to do better on the test' (p 150). Similarly one may postulate that adult learners need adequate content exposure if they are to successfully complete GED programs and exams; this is, of course, in addition to high-quality engagement. The high percentage of intervals coded as None, that is, conditions and behaviours that do not fit any of the MS-CISSAR categories of teacher-student engagement (eg, academic content, materials, teacher, and student behaviours), and the high percentage of intervals coded as No-one in the area of teacher focus seem to indicate that content exposure was not optimal in either program during the time of these observations.

Some interesting differences between the programs were found in teacher behaviour when no teacher-student interactions (codes such as No response, None, or Staff Discussion) were observed. These differences can be explained in a variety of ways. Most of these non-interactions occurred when students were either self-engaged in academic work or briefly absent from the room. Teacher activities varied during these periods, with some teachers preferring to grade papers, a teacher behaviour coded as having No Response to the students. Other teachers preferred to sit at their desks and

observe the room. For example, this activity was the case with the teachers at the AEC when their students were engaged in computer work. This type of teacher behaviour was coded as None.

One might surmise that the large amount of time coded as None represents a shortcoming in the modified MS-CISSAR measurement system. However, in a related study of adult education classrooms utilising the same tool, only about five percent of teacher behaviours were coded None or No Response during the same type of one-to-one instructional grouping as well as during whole group direct instruction (Mellard and Scanlon, in press). Therefore, we believe the instructor behaviour, and not the measuring system, exhibited shortcomings.

The classrooms' physical setups may explain the difference in the amount of staff discussion at the two centres. At the CEETC, the teachers' desks were adjacent to one another with a divider between them, an arrangement seeming to favour interaction between instructors, which was coded as Staff Discussion. The teachers' desk at the AEC were much further apart in a large classroom, which may explain their lower percentage of observed staff discussion.

A second difference between AEC and the CEETC sites involved the academic content and, consequently, the types of materials used. For example, during the periods when the CEETC was observed, instruction was more oriented toward English-related subjects classified as Written Language (17%) and Reading (16%). The AEC was more oriented toward teaching subjects classified as Science (5%) and Math (24%). As a result, different materials were used. The CEETC used writing materials more often, including Paper and Pencil, Readers, Workbooks, and Worksheets, whereas AEC learners were exposed to Computers more than four times as often as the CEETC learners (27% vs. 6%). The CEETC has a well-equipped computer lab with hardware and extensive software, but students used the lab for their own enrichment rather than instructional content. One might expect different verbal interaction patterns related to the instructional media (ie computer usage) incorporated into the lessons.

Student behaviour, specifically Computer Work, Writing, and Attention to the teacher, corresponded with the differences between the programs' academic content and materials. The AEC learners participated in Computer Work more than seven times as often as students in the CEETC for the reasons noted above. Student attention to the teacher was evidenced more at the CEETC than at the AEC because AEC students were involved more frequently in independent learning activities like Computer Work or Writing than were students at the CEETC. One level of analysis was completed without reference to differences among instructional contents. At some point we will likely want to examine the data for specific differences

such as how teacher focus and interaction patterns vary with the content (eg reading) or skills (eg keyboarding).

The most important characteristic of the instructional environment in both centres was the relatively large portion of time when teachers were not focused on students, no discernible subject was being instructed, no identifiable materials were being used, and teacher behaviours as well as student behaviours did not correspond to any of the categories related to learning and instruction (41% of the intervals, or 25 min/hr). At minimum, these findings indicate that student opportunity to learn was diminished and academic engagement time was not maximised. As staff reviewed these findings with the AE instructors, the instructors' surprise was in realising the high proportion of non-engagement. The data's accuracy was not questioned. They had not realised how the instructional minutes in an hour could so quickly be directed to activities away from students such as grading papers, staff discussion, completing phone calls, organising students' work folders, preparing worksheets and materials, putting away books, and setting up equipment.

Conclusion

Adult educators have limited time with students, and students want to make the most gains that they can as quickly as possible. We believe that creating as much opportunity to learn during that time – by choosing instructional groupings, topics, materials, and activities that will engage that students – is imperative. More interaction is insufficient if the interaction does not involve academic engagement. To see a notable increase in academically engaged behaviours such as Academic Talk, teachers may require additional tools to improve instructional practices. Our hope is that educational researchers will build upon the findings presented here to develop and validate improved instructional practices for adult eduction.

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