

Student Attention and Distraction in Community College

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Abstract

The attention span of students and their ability to shut out distractions are learning conditions that concern educators more than ever before. Faculty at a community college assessed the learning conditions of students related to attention and distraction. Students self-administered an online Selective Attention Poll consisting of 20 multiple-choice items. The 239 culturally-diverse volunteers were 161 females and 78 males. Results indicated that most students believe they can get more work done in less time by multitasking, and consider this practice as necessary to meet the demands of college. Teachers could help students improve achievement by arranging innovative cooperative learning practices and developmental reading procedures. The majority of students declared their home as the most difficult place to study. Parents should provide a quiet environment and recognize student need for continued emotional support in early adulthood. The challenges for community college faculty are to help students improve study habits so they become more able to concentrate on assignments, read in-depth, value reflective thinking, diminish distractions, and build skills to work in groups.

Keywords: attention, cooperative learning, distraction, multitasking, reading

1. Introduction

1.1 Statement of the Problem

College faculty have observed that student attention, reflective thinking, concentration, and comprehension seem to be in decline (Hari, 2022; Kim & Maloney, 2020; Lang, 2020; Mark, 2023). Related educational psychology concerns are to: (a) explore why paying attention is becoming more difficult, (b) examine why many students are assigned to remedial reading, (c) explain why screen skimming is the new normal, (d) illustrate how innovative cooperative learning strategies can enlarge the scope of student achievement, and (e) report an online polling study that describes attention and distraction experiences of college students.

1.2 Importance of the Problem

Teachers are concerned that many students seem to be losing their ability to pay attention, reflect, and comprehend. Attention is an important cognitive asset that can help students focus, concentrate on learning and avoid distractions. Faculty seek evidence-based data about how to improve conditions of learning for students in the classroom and while studying at home (Lang, 2020).

1.3 Literature Review

1.3.1 Importance of Selective Attention

William James wrote the first book that defined the study of psychology. In *Principles of Psychology*, James (1890/1950) described *attention* as the conductor leading orchestration of the mind, enabling people to focus on one of several simultaneous possible trains of thought. Being wise is knowing what to overlook. The ability to distinguish relevant information from irrelevant distractions is a critical thinking skill needed for achievement. When James was asked how many things a person can pay attention to at one time, he replied, "Not easily more than one."

Fast forward to the present and awareness of how communications technology has made more knowledge available and greater exposure to distraction. Erosion of attention is reflected by widespread student participation

with multitasking. Students perform poorly when they try to manage more than a single task, overestimate how many tasks they can do well at the same time, get distracted following links, and lose touch with the reference goals needed to guide online activity (Whybrow, 2016; Wu, 2016). These problems are motivating researchers to find ways to anchor student attention and support concentration (Mark, 2023). Involvement with multiple media causes students to spread their attention over a broader context, making less attention available for focus (Goleman, 2015; Jackson, 2018; Kim & Maloney, 2020).

1.3.2 Multitasking and Mental Abilities

One challenge of being able to pay attention involves the common opinion that multitasking improves productivity by enabling us to accomplish more in less time. However, information processing experiments have led to an opposite conclusion. Ophir et al. (2009) administered three tests to 100 students to detect the mental abilities where multitaskers are more competent. Multitasking was defined as receiving and using multiple streams of unrelated information simultaneously. First, students completed a questionnaire to assess their linking of different media. Next, they were asked how often they engaged in more than one media category and estimated the amount of their participation time. Then students were divided in two groups, those involved with more media multitasking and others who engaged in less multitasking.

Three mental abilities were evaluated: filtering, working memory management, and task switching. Filtering is defined as the ability to ignore irrelevant data while focusing on relevant information. High multitaskers were captivated by distractions and irrelevant data. The more irrelevant information that they observed, the more they were attracted by it. The second ability, working memory management, relates to having organized mental filing cabinets where data is carefully stored so that, when information is needed, people know immediately the right cabinet to find it. Again, high multitaskers showed themselves less capable in performing this task. The greatest surprise involved the third mental ability of task switching, moving from one task to another. It was expected that high multitaskers would show superiority in this context. However, their performance was actually much slower and ineffective. The investigators concluded that high multitaskers draw on all the information in front of them; they cannot keep things separate in their mind, are unable to filter out what is irrelevant or pay attention to what matters most. By doing less, they could accomplish more (Ophir et al., 2009).

1.3.3 Distraction and Academic Performance

Neuroscience studies have found that the brain slows down when someone is distracted and needs to manage more than a single task. Switching back and forth from one task to another results in retention problems (Hari, 2022; Jensen & Nutt, 2015). We may forget what we were just doing or had been planning to do. The 'to-do' list in the brain, called *working memory*, keeps track of short-term things to be remembered such as an email address someone just gave us. However, the content of working memory vanishes quickly, as fast as two seconds. Within 15 seconds of considering a new problem, individuals might forget the task they were working on (Cozolino, 2014; Whybrow, 2016; Wolf, 2019).

Surveys in a new field called *interruption science* have found that it can take 15 minutes for employees to regain concentration after being distracted (Mark, 2015, 2023). Concentration often begins to drift after reading only a couple pages of a document. The deep reading that once was common has become a struggle. Then too, improving the ability to multitask hampers capacity to think deeply and further degrades performance (Gazzaley & Rosen, 2016). Evidence suggests that the more someone multitasks, the less deliberative they become, less able to reflect and cannot concentrate on solving problems (Liu, 2015). In addition, the brain needs recovery time to consolidate memories and thoughts. If, instead, every quiet moment is taken up by texts or other interruptions, the brain reprieve needed from external stimulation cannot occur (Jackson, 2018; Lang, 2020).

Teachers have told some parents that their child's lack of attention is cause for concern because it detracts from achievement (Hari, 2022). This problem often begins before children enter school. McClelland et al. (2013) collaborated with the National Institute of Child Health and Human Development to track 430 children from the age of 4 until they were 25 to identify factors that would have the most influence on completing a college degree. In early childhood parents were asked to rate their daughter or son on items such as, "S/he plays with one toy for a long time," or "My child gives up quickly when faced with difficulties." Reading and mathematics were tested at age 7 with standardized tests and again at age 21. Contrary to expectation, reading and mathematics did not predict whether young children would eventually finish college. Instead, the children rated one standard deviation higher for their attention span-persistence as observed by parents at age 4 had 50% greater odds of earning a bachelor's degree by age 25.

Posner (2012) has studied how attention is critical for perception, language, and memory. He urged reflection

about the possibility that we are evolving to be a society that prizes frenetic movement, accepts fragmented work, and craves instant answers. Ultimately, these conditions will do more than just speed up the pace of living. A social environment that places excessive emphasis on the present time while avoiding reflective consideration for the future can restrict the scope of focus, awareness, planning, and judgment that comprise attention.

Attention and persistence are skills everyone should learn. Students are daily exposed to distractions that prevent concentration and diminish the attention that is needed for thinking. Neuroscientist Robert Desimone directs the McGovern Institute for Brain Research at the Massachusetts Institute of Technology. In an interview, Desimone said, “I’ve learned that our ability to filter out distractions using our attention systems is far inferior to simply physically removing distractions. Turn off the music, turn off the TV, focus on the task at hand, and you’ll perform much better” (Ortiz, 2019, p. 2).

1.3.4 Paper and Screen Reading Comprehension

Being able to pay attention is shown by student reading habits. Educators acknowledge that Internet screen skimming is the method of reading students prefer, replacing the reading of books that many claim takes too long and requires greater patience than they can demonstrate. Instead of skimming as a preliminary way to judge relevance of material as people did in the past, skimming has become the way students quickly sample data from multiple sources while they try to make sense of the collective content. Liu (2015) surveyed middle-aged professionals from engineering, education, business, health sciences, and technology to find out how their reading habits had changed during the past decade. Over 80% reported they were involved most with screen skimming of Internet documents. About 45% admitted that deep reading had significantly declined for them.

According to Liu (2015), the Internet encourages exploration of many topics but at a superficial level and hyperlinks further distract students from careful reading and deep thinking. People spend more time reading today than past generations but reliance on screen skimming differs greatly from concentrated reading that requires a sustained focus of selective attention and reflection. Adolescents multitask and screen skim more often than adults (Jackson, 2018). Such practices also undermine the preservation of creativity. Being able to concentrate, value reflective thinking, and pay attention for lengthy periods are common characteristics of highly creative people (Cleese, 2020; Turkle, 2016, 2021).

Early research by Mangen et al. (2013) examined how 72 high school students understood the same material when it was presented in two different mediums. Students were randomly assigned into two groups. One group read linear texts (1400-2000 words in print) while the other group read the same materials on a computer screen. Reading comprehension tests were administered. Findings showed that those who read print texts performed significantly better on measures of reading comprehension than students who read in a digital form.

Similar results were obtained in a larger study by Støle et al. (2020) involving 1,139 ten-year old students. The conclusion of this study was that reading books trains us to read in a linear manner and stay focused on just one thing for a sustained period. But, as elementary students become more involved with screen skimming, a flip takes place and in-depth reading ceases to be a preference. In addition, Delgado et al. (2018) conducted a meta-analysis of 34 studies involving 171,000 young adults and found that paper-based reading resulted in greater comprehension than digital-based reading; the advantage of paper-based reading comprehension has increased since the year 2000.

1.3.5 Developmental Reading in Community College

Based on placement test scores, Chen (2022) reported large numbers of students beginning community colleges and universities are required to take developmental reading classes without credit toward a degree. Yadusky et al. (2020) stated, “Fewer than 10% of students who are relegated to developmental coursework actually obtain degrees within the expected measured timespan (usually six years)” (p. 424). The main cause for remediation is inability to comprehend complex texts. Rey (2019) and Follmer et al. (2022) explained that unwillingness of college students to participate in slower more careful reading is implicated. Students often feel they should not be required to take developmental reading class because they had good grades in high school. A more promising outlook by Lavonier (2015) recommended that community college leaders evaluate the effectiveness of teaching methods in developmental courses to ensure at-risk students are receiving relevant orientation and instruction.

1.3.6 The Biliterate Brain

Wolf (2019) is a neuroscientist who studies the effects of digital media on reading and thinking. While reading on a digital medium, students skim, browse, and quickly look for key words. This process reduces the time spent to grasp complexity. Many students say they do not have time to comprehend complexity, understand someone else's feelings as occurs when they engage in deep reading that fosters critical analysis and empathy. Wolf asserted that

there is a need to cultivate a biliterate reading brain capable of the deepest forms of thinking.

Baron (2021) concluded that teachers and parents should be less concerned about the cognitive impatience of students than by how to help them read with a level of critical analysis sufficient to comprehend complex thought and argument that appears in challenging texts. The loss of critical analysis, empathy, and other deep reading processes could become collateral damage of a digital culture. This is not a simple issue of preference for print versus screen reading. Instead, it is about the way everyone reads on any medium and how that changes the purposes for reading.

The willingness of students to replace less effective study skills for more effective habits should not be assumed. Hairston-Dotson and Incera (2022) studied 249 college students to learn their impressions about more complex reading skills and whether they practiced these skills when working on assignments. Although students acknowledged the greater applicability of complex reading skills than screen skimming, most admitted they relied primarily on screen skimming. These findings showed that understanding what is most beneficial and useful does not necessarily translate into actual practice in working on school assignments.

1.3.7 Types of Thinking

We seem to have arrived at an unprecedented stage in intellectual and cultural history, a time of transition between two very different types of thinking (Carr, 2015). What we could be trading in return for the wealth of what is offered by the Internet is traditional competence with linear deep thought processes. In the past, printed books served as the focus of attention for learners, promoting reading comprehension, reflection, deliberation, and creativity. Calm, focused, and undistracted, the linear mind is gradually being replaced by a more popular mindset that prefers to take in and express information in short and disjointed bursts, the faster the better (Cleese, 2020).

Since the printing press made reading books possible more than 500 years ago, the linear mind has been at the forefront of art, science, and society. Gradually the linear mind is being edged aside. Carr (2020) has illustrated how computers exert a subtle influence on the ways we think. At some point many people discover it is no longer possible to edit on paper because they can only do it online. They feel lost without a scroll bar, cut and paste functions, and delete key. Kim and Maloney (2020) have observed that many people seem unaware of their vanishing ability to pay attention to one thing for more than a couple minutes.

To read a book silently requires the ability to concentrate for a long time, to lose oneself in the pages. Developing such mental discipline takes time and can be difficult. The natural state of the brain reflects distraction. The predisposition is to shift attention from one thing to another, to become aware of as much as possible about what is going on around us. Neuroscience has determined that primitive mechanisms in the brain respond rapidly to sensory input and shift attention involuntarily to visual features of potential importance (Gazzaley & Rosen, 2016). What draws attention most is any change in our surroundings. When something changes, we take notice because it could present danger or opportunity. This fast reflexive shift in focus was needed in the distant past for survival to reduce prospects that a predator would surprise people. The usual path for most of human thought was anything but linear (Carr, 2015).

1.3.8 Previous Scholarship Using Polls

Strom and Strom (2002) introduced student polling as a means to focus on perceptions about conditions of learning, barriers to academic achievement, and answers to common problems; "Knowing how students feel about particular processes and events at school would not obligate the faculty to modify policies. However, it would lead to greater awareness and therefore more informed decisions" (p. 190-191).

The development of poll topics were drawn from literature about adolescent views on conditions of learning, and outcomes of student focus groups held at several schools (Strom, Strom, & Wing, 2008). Based on these sources, ten multiple-choice online polls were constructed, each featuring a separate context of learning (Strom & Strom, 2016). The topics included career exploration, cheating, cyberbullying, Internet learning, student frustration, tutoring, time management, school stress, peer support, and selective attention. Obligations of the student focus groups were to judge the content relevance of each poll, ease of understanding items, and suitability of response options. After getting student feedback, polls were revised and checked for reading level using the Flesch-Kincaid Readability Index.

The polls were field-tested by Wing (2007) with 2,575 students at eight secondary schools. Overall, the school location variable recorded the highest relationships to student responses (46%), followed by gender (35%), and grade level (23%); ethnicity had the lowest number of significant relationships (17%). These findings support the conclusion that student polling should focus on one school only where results should be used to improve that particular school (Strom, Strom, & Wing, 2008; Strom, Hendon, & Strom, 2023).

1.4 Research Questions Related to the Current Study

The following three research questions guided the poll study to assess college student attention and distraction.

- 1) Why is paying attention to school work a common problem among students in college?
- 2) What conditions of learning do students prefer that can support academic attention?
- 3) What should teachers, students, and parents do to improve student attention?

2. Method

2.1 Participant Characteristics

Faculty from a community college in the southwest region of the United States wanted to learn from students about their experiences with attention and distraction. Approximately 450 students from classes of reading, first-year composition, psychology, sociology, and humanities were invited to participate; 239 students (53%) agreed to participate. The students who volunteered were 161 females and 78 males; their average age was 18.84 years. Students identified their ethnicity as Asian ($n = 20$), Black ($n = 13$), Hispanic ($n = 47$), White ($n = 135$), Native American ($n = 7$) and other ($n = 17$).

2.2 Instrumentation

For the current study, the Selective Attention Poll was used to assess student attention and distraction experiences while in the classroom, researching on the Internet, and studying at home. The purposes of this 20-item poll are to identify preferred conditions of learning and ways teachers, students, and peers can contribute to student attention (Strom & Strom, 2023).

2.3 Procedures

The Selective Attention Poll with directions were accessible online for students. The poll was self-administered, and the completion time was approximately 15 minutes. Student involvement was voluntary, not an assignment, and their responses were anonymous. This procedure provided confidential data-based evidence to be used for school improvement. The data were gathered in Spring 2022.

2.3.1 Data Analysis

Students' responses for each item were calculated from the online poll and reported by frequencies (n) and percentages (%) to the faculty and students. Showing results in this way allowed the entire school to understand the poll outcomes and implications.

3. Results

3.1 Overall Results

Table 1 presents overall frequencies (f) and percentages (%) by 239 students for the 20 items on the Selective Attention Poll. There were few "other comments" made by students.

Table 1. Selective Attention Poll

	Poll Items	f	%
Q1.	Paying attention in class can be difficult when		
	I feel tired from a lack of sleep	198	82.85
	there are student interruptions	74	30.96
	I worry about things outside school	178	74.48
	teacher lectures are boring	134	56.07
	other	11	4.60
Q2.	The ways I try to avoid distraction while studying are		
	turn off devices that can interfere with thinking	141	59.00
	tell my family that I do not want to be disturbed	97	40.59
	set aside enough time so I do not have to hurry	132	55.23
	stay focused on one task at a time	161	67.36
	other	7	2.93

Q3.	When classmates interrupt me while I am trying to study at school		
	I accept their interference as a normal event	126	52.72
	I get off track and lose my line of thinking	128	53.56
	I get frustrated because it limits achievement	49	20.50
	I tell them to be quiet	28	11.72
	other	10	4.18
Q4.	Paying attention is easier when		
	Internet assignments allow self-directed learning	110	46.03
	time in class is spent working in groups	87	36.40
	teachers provide visuals that help with understanding	195	81.59
	teachers enforce rules that help to minimize noise	54	22.59
	other	10	4.18
Q5.	The most difficult time for me to pay attention is		
	during first hour at start of the school day	77	32.22
	in subjects where I don't perform as well	145	60.67
	if students talk when they should be quiet	66	27.62
	when friends text me while I am in class	51	21.34
	when I am assigned to read from a book	106	44.35
	other	13	5.44
Q6.	My teachers could help me concentrate better if they		
	assign quiet reflective thinking tasks during class	55	23.01
	stop messages over the intercom	13	5.44
	give individuals separate tasks to do for group work	86	35.98
	balance lecturing and group learning	165	69.04
	other	12	5.02
Q7.	The pace of learning in my classes seems hurried		
	always	14	5.86
	often	81	33.89
	seldom	105	43.93
	never	39	16.32
Q8.	When I try to study in school		
	I am frequently interrupted	22	9.20
	I am sometimes interrupted	90	37.66
	I am seldom interrupted	90	37.66
	I am never interrupted	37	15.48
Q9.	When I try to study at home		
	I am frequently interrupted	65	27.20
	I am sometimes interrupted	94	39.33
	I am seldom interrupted	64	26.78
	I am never interrupted	16	6.69
Q10.	The places where it is most difficult for me to concentrate are		
	school classroom	89	37.24
	school library	40	16.74
	public library	60	25.10
	my home	129	53.97
	other	14	5.86
Q11.	I am distracted during group discussions in class because		
	students often interrupt each other	56	23.43
	some students feel they should do most of the talking	81	33.89
	no one invites me to express my opinion on the topic	32	13.39
	people talk about other things than the assigned topic	151	63.18
	other	19	7.9

Q12.	Multitasking means doing more than one thing at the same time and helps me to get more done in less time	111	46.44
	increases the number of mistakes I make	65	27.20
	makes me lose concentration and forget	86	35.98
	is necessary to meet the demands on me	90	37.66
	other	8	3.35
Q13.	I would rate my listening skills at school as excellent	48	20.08
	good	178	74.48
	poor	11	4.60
	bad	2	0.84
Q14.	I believe that performing well in difficult subjects is possible only for students with high abilities	27	11.30
	when a student who falls behind gets tutoring	68	28.45
	when someone works hard and does not quit	209	87.45
	when a student pays attention most of the time	132	55.23
	other	4	1.67
Q15.	Some students do not like to spend time alone because they prefer constant action instead of silence	150	62.76
	they never learned how to value being alone	103	43.10
	it means they must set aside their cell phone	66	27.62
	they like to talk with others most of the time	139	58.16
	other	6	2.51
Q16.	The methods I prefer for reading are go over content quickly by skimming	109	45.61
	look over short summaries of content	152	63.60
	study visuals that illustrate the text	135	56.49
	read in-depth details about the content	94	39.33
	other	6	2.51
Q17.	The greatest obstacles for my concentration are difficult subjects that cause boredom	147	61.51
	teachers who talk too much in class	69	28.87
	having lengthy text materials to read	178	74.48
	feeling that the reading is impractical	99	41.42
	other	8	3.35
Q18.	Screen skimming is a common method for Internet reading that is good because it takes less time than regular reading	93	38.91
	helps to cover a lot of class readings quickly	105	43.93
	provides only brief and incomplete knowledge about class concepts	135	56.49
	is preferable because I do not like to read	59	24.69
	other	5	2.09
Q19.	When I am assigned reading from a textbook in class I am able to read for a long period of time	39	16.32
	I need frequent breaks in order to finish my reading	131	54.81
	I lose interest after reading only a few pages	133	55.65
	I enjoy reading if I like the course	113	47.28
	other	4	1.67
Q20.	I am able to pay attention when doing my homework while also texting friends or watching tv	73	30.54
	by shutting out all the possible electronic distractions	107	44.77
	when family members leave me alone in my room	151	63.18
	when I phone classmates doing the same assignment	44	18.41
	unless it involves a subject I do not like or understand	74	30.96
	other	15	6.28

From *Learning polls for secondary school and college students: Selective Attention Poll*, by P. S. Strom & R. D. Strom, 2023. <https://learningpolls.org> Copyright © 2015 by P. S. Strom & R. D. Strom.

Note. $N = 239$.

3.2 Results for Research Questions

1) Why is paying attention to school work a common problem among students in college?

This question was answered by poll items 1, 2, 3, 5, 7, 8, 9, 17 and 20 appearing in Table 1. Most students agreed that being tired was their main reason for having trouble paying attention (item 1); another reason was they worried about things that occur outside of school. Classmates were identified as a major source of interruption who caused loss of focus and prevented staying on track with thinking (item 3). A majority of students described the most difficult time to pay attention is in subjects where they do not perform well (item 5). Teachers should be aware that some students felt the pace of class instruction was always or often hurried (item 7). The greatest obstacles to concentration were difficult subjects that caused boredom, being assigned lengthy materials to read, and believing some assignments were impractical (item 17). Being interrupted frequently or sometimes by peers (item 8), and relatives at home (item 9) represented distractions from learning. The ways to avoid distractions while studying were to: stay focused on one task at a time, set aside enough time to avoid feeling hurried, tell family members not to disturb them when they are studying, and turn off devices that can interfere with thinking (item 2). While studying at home, students can do homework when family members leave them alone in their room, and by shutting out all the possible electronic distractions (item 20).

2) What conditions of learning do students prefer to support academic attention?

This question was answered by poll items 3, 4, 6, 11, 12, 14, 16, 18, and 19. Students presented a common complaint that people talk about other things than the teacher assignment during group discussions; some students felt they should do most of the talking (item 11). Most students accepted peer interference as a regular event during class, and stated it caused them to lose their line of thinking (item 3). Paying attention is easier when teachers provide visuals as part of their instruction, make Internet assignments that include self-directed learning, and enforce rules that minimize noise (item 4). The methods preferred by students for reading were to look over short summaries of content, and study visuals that illustrate the text (item 16). Students believe that performing well in difficulty subjects is possible when someone works hard and does not quit (item 14). Teachers could help students concentrate better when they balanced lecturing and group learning, and gave individuals separate tasks to do for group work (item 6). Students recognized screen skimming for Internet reading can offer only brief and incomplete knowledge about class concepts (item 18). When assigned reading from a textbook, students needed frequent breaks to finish their reading, and were distracted after reading only a few pages (item 19). Many students believed that individual multitasking enabled them to get more done in less time (item 12).

3) What should teachers, students, and parents do to improve student attention?

This question was answered by poll items 1, 2, 4, 6, 9, 10, 11, 13, and 15. Teachers should present Internet assignments that enable opportunities for self-directed learning, provide visuals to enable understanding of concepts, spend time in class working in groups, and enforce rules to minimize noise (item 4). The biggest obstacle to attention was fatigue (item 1). Students want teachers to balance time spent on lecturing and group learning, and assign individuals separate tasks to do for group work (item 6). More attention to study is possible when students stop talking about things outside the teacher assigned topic (item 11), and improve listening skills (item 13). Many students do not value silence groups need for reflection; instead, they prefer constant interaction (item 15). Parents should know a majority of students identified home as the most difficult place to study because of excessive interruptions (items 9 and 10); students avoided some distractions by telling relatives not to disturb them (item 2).

4. Discussion

4.1 Implications for Teachers

Nearly half the student reported that they rely on multitasking to get more schoolwork done in less time. A healthier way to prevent feelings of being overwhelmed emerges when teachers demonstrate how multitasking is a suitable expectation for cooperative group learning but not for individuals. Academic achievement has historically been defined in terms of student independence and self-reliance. These strengths continue to be important but are no longer seen as the total design for individual success or group productivity. Labor market competition has motivated employers to hire new recruits who have teamwork skills and can collaborate with co-workers in solving complex problems. Consequently, the traditional goal of schools to foster independence should expand to include appreciation for interdependence as the path to enable group achievement. This broader goal is implemented when students become a source of instruction for peers while also learning from them in cooperative learning groups (Johnson & Johnson, 2017; Strom et al., 2019).

The student transition from being passive learners to being self-directed and able to work with teammates to solve problems requires innovative assignments given by teachers. In the past when teachers were the main source of

learning they presented lessons that all the students were expected to memorize. Everyone was expected to complete a uniform task for homework. The Internet is now the main source of information so the guidance function of teachers should shift to emphasize differentiated assignments that are suitable for cooperative learning teams (Johnson & Johnson, 2017; Strom, Strom, & Wang, 2022). In this innovative paradigm, individuals are not overwhelmed. Instead, cooperative learning teams have a collective workload and make each person accountable for completing a specific task (Sayegh & Rigopoulos, 2022). Later, teammates report to the group what has been learned independently before combining efforts for submission to the classroom teacher.

Some notable conditions of achievements become prominent when cooperative learning takes place in this way (Strom & Strom, 2021; Strom, Strom, & Wang, 2022). First, being accountable to complete a separate task in solving a complex group problem narrows the expectation for each member of a team. In effect, no one has a reason to multitask. Second, group learning expands because each person is responsible for making a unique contribution. Third, each individual tells teammates about what has been learned independently before work is combined for submission to the classroom teacher. This process ensures that every student becomes a peer teacher and should be involved in evaluation of self and peers. Fourth, attention is given to reports from individuals that describe their independent learning.

4.2 Implications for Parents

Most of the community college students lived at home with their parents. This situation generally provides benefits in reducing cost of living, access to family cooked meals, frequent conversation, and encouragement from loved ones. However, a majority of students reported that home was the most difficult place for them to concentrate as they were frequently or sometimes interrupted by relatives. Most students were able to pay attention while doing their homework when family members left them alone in their room, and they shut out all possible electronic distractions. Some of the students had to tell relatives that they did not want to be disturbed.

The community college faculty should consider developing an orientation program for parents that acknowledges the contributions they make to the mental health of students and identifies ways they can further increase support for academic progress. Southwick and Charney (2018) determined that resilient individuals tend to strive toward a good outcome without feeling overwhelmed by conditions that threaten their development. Parents should know that resilience is the ability of individuals to restore a sense of balance following a difficult experience and integrating it into the total life perspective (Strom et al., 2021). The resilient experience doubts and uncertainties like everyone else but possess an ability to recover quickly following setbacks or disappointments that might cause others to quit. Resilient people are flexible, share faith, hope, and optimism about the future.

Resilience is at the highest level in childhood (Lustig, 2020). However, when students become teenagers, the resilience levels drop sharply, as much as 50% by ages 18 to 23. Parents should help family members process disappointing events and situations because they have dealt with negative experiences themselves and are able to show empathy. Being a willing and careful listener is an important responsibility for parents of a college student.

4.3 Implications for Students

Poll responses revealed a need to change some student habits implicating management of time and coping with stress (Strom et al., 2021). These changes, reinforced by research in the review of literature, included a common dislike for assignments that require reading lengthy text materials (Hari, 2022; Liu, 2015), preference for having short summaries of lessons (Wolf, 2019), reliance on screen skimming because it takes less time, and covers class reading content quickly (Carr, 2015, 2020). Students reported needing frequent breaks to finish reading assignments (Jackson, 2018), losing interest after reading only a few pages (Goleman, 2015; Rey, 2019), and wanting to have visuals that illustrate lessons (Kim & Maloney, 2020). Only a small proportion of students stated that they can read for a long period of time (Baron, 2021).

Similar dysfunction was described about processes of working together in cooperative learning groups. Frequent complaints were that when students are in groups some people talk about other things than the assigned topic, prefer to have constant conversation instead of accepting a need for periodic reflective silence, and some members think that they should do most of the talking (Johnson & Johnson, 2017; Strom et al., 2022; Turkle, 2016). Ironically, students rated their listening skills at school as excellent or good.

In conclusion, an intervention plan was recommended to have periodic cooperative learning team discussions focused on five issues to improve performance and accountability.

1) Teachers should acknowledge the importance of deep and sustained reading along with screen skimming. Surfing the Internet to locate data, exploring links, and interacting online provide benefits and has widespread appeal. In addition, everyone needs another set of mental assets that include the ability to pay attention to one task

at a time, avoid distractions by screening them out, and concentrating for lengthy periods. When students process information quickly and in short bursts, this inhibits the contemplative brain dimension that provides capacity to form insights and empathy. Support for both reading methods seems the best way to enhance intelligence, foster health, and improve productivity.

2) Recognize that young adults prefer non-sequential Internet-based reading. Some students consider deep reading outdated and try to persuade educators to diminish such expectations. This means they generally object to teacher assignments intended to help them acquire this competence. Being assigned a lengthy document to read or expected to listen to a lecture brings complaints about boredom. Nevertheless, faculty and parents should continue to insist on student involvement with deep reading to ensure they gain the perspective that is needed to build a promising tomorrow.

3) Cooperative learning teams in which students have differentiated assignments can help them recognize that the scope of classroom instruction expands when peers become sources of learning. Students can change their minds when presented with research evidence that contradicts their assumptions about the effects of multitasking. Teachers should acquaint students with studies on limitations of individual multitasking and recognize that multitasking is a reasonable expectation only for teams.

4) Students should establish a priority for how they manage time to ensure their schedule includes non-electronic time for uninterrupted reflection, self-evaluation, and critical thinking. Being able to focus attention and concentrate for lengthy periods of time should become goals for all students.

5) The power of distraction should not be allowed to undermine healthy cognitive development. Each student should try to diminish all distractions while studying. Set a study time frame during which the phone and all other electronic devices are turned off.

4.4 Limitations

All students were in their first year of community college; there were more females ($n = 161$) than males ($n = 78$). The number of poll participants enrolled in remedial reading classes was not determined.

4.5 Conclusion

Many young people need help with the difficulty of paying attention, a problem they share with most generations. Teachers, parents, and students should work together to address the related issues collectively. Jackson (2018), author of *Distracted: Reclaiming Our Focus in a World of Lost Attention*, raises the issue, "Are we ready to face up to one of the most pressing problems of our age? ... Attention is the stepping stone to wisdom, intimacy, and creativity. It is the capacity that decides the fate of the present moment and determines the shape of the future. Without it, we are adrift. It is now time to focus on what matters and give attention its due" (page 12).

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References

- Baron, N. S. (2021). *How we read now: Strategic choices for print, screen, and audio*. New York, NY: Oxford University Press.
- Carr, N. G. (2015). *The glass cage: How our computers are changing us*. New York, NY: W.W. Norton.
- Carr, N. G. (2020). *The shallows: What the Internet is doing to our brains*. New York, NY: W.W. Norton.
- Chen, G. (2022, March 21). Why do 60% of community college students need remedial coursework? *Community College Review*. Retrieved from <https://www.communitycollegereview.com/blog/why-do-60-of-community-college-students-need-remedial-coursework>
- Cleese, J. (2020). *Creativity: A short and cheerful guide*. New York, NY: Crown.
- Cozolino, L. (2014). *The neuroscience of human relationships* (2nd ed.). New York, NY: W.W. Norton.
- Delgado, P., Vargas, C., Ackerman, R., & Salmeron, L. (2018, November). Don't throw away your printed books: A meta-analysis on the effects of reading comprehension, 25, 23-38. *Educational Research Review*. <https://doi.org/10.1016/j.edurev.2018.09.003>
- Follmer, D. J., Patchan, M., & Spitznogle, R. (2022). Supporting college learners' study time calibration: Relations to course achievement and self-regulated learning skills. *Journal of College Reading and Learning*, 52(2), 75-96. <https://doi.org/10.1080/10790195.2022.2033646>

- Gazzaley, A., & Rosen, L. D. (2016). *The distracted mind: Ancient brains in a high-tech world*. Cambridge, MA: The MIT Press.
- Goleman, D. (2015). *Focus: The hidden driver of excellence*. New York, NY: Harper.
- Hairston-Dotson, K., & Incera, S. (2022). Critical reading: What do students actually do? *Journal of College Reading and Learning*, 52(2), 113-129. <https://doi.org/10.1080/10790195.2022.2033648>
- Hari, J. (2022). *Stolen focus: Why you can't pay attention -- and how to think deeply again*. New York, NY: Crown.
- Jackson, M. (2018). *Distracted: Reclaiming our focus in a world of lost attention*. Amherst, NY: Prometheus.
- James, W. (1950). *The principles of psychology, Vols. I and II*. Garden City, NY: Dover. (Original work published 1890)
- Jensen, F. E., & Nutt, A. E. (2015). *The teenage brain: A neuroscientist's survival guide to raising adolescents and young adults*. New York, NY: Harper.
- Johnson, D. W., & Johnson, R. T. (2017). The use of cooperative procedures in teacher education and professional development. *Journal of Education for Teaching*, 43(3) [Cooperative Learning: Exploring Challenges, Crafting Innovations], 284-295. <https://doi.org/10.1080/02607476.2017.1328023>
- Kim, J., & Maloney, E. J. (2020). *Learning innovation and the future of higher education*. Baltimore, MD: Johns Hopkins University Press.
- Lang, J. (2020). *Distracted: Why students can't focus and what you can do about it*. New York, NY: Basic Books.
- Lavonier, N. (2015). Evaluation of the effectiveness of remedial reading courses at community colleges. *Community College Journal of Research and Practice*, 40(6), 523-533. <https://doi.org/10.1080/10668926.2015.1080200>
- Liu, Z. (2015, January). Information behavior in the mobile environment: An overview. *School of Information Student Research Journal*, 5(2), 1-6. <https://doi.org/10.31979/2575-2499.050202>
- Lustig, S. (2020). Cigna resilience: How we can help children and young adults build resiliency? YouTube. https://www.youtube.com/watch?v=y_RxItYbi84
- Mangen, A., Walgermo, B. R., & Brønnick, K. (2013). Reading linear texts on paper versus computer screen: Effects on reading comprehension. *International Journal of Educational Research*, 58, 61-68. <https://doi.org/10.1016/j.ijer.2012.12.002>
- Mark, G. (2015). *Multitasking in the digital age*. San Rafael, CA: Morgan & Claypool.
- Mark, G. (2023). *Attention span: A groundbreaking way to restore balance, happiness, and productivity*. New York, NY: Harper Collins.
- McClelland, M. M., Acock, A. C., Piccinin, A., Rhea, S. A., & Stallings, M. C. (2013). Relations between preschool attention span-persistence and age 25 educational outcomes. *Early Childhood Research Quarterly*, 28(2), 314-324. <https://doi.org/10.1016/j.ecresq.2012.07.008>
- Ophir, E., Nass, C., & Wagner, A. D. (2009). Cognitive control in media multitaskers. *Proceedings of the National Academy of Sciences in the United States*, 106(37), 15583-15587. <https://doi.org/10.1073/pnas.0903620106>
- Ortiz, R. D. (2019). Mental models [An interview with Robert Desimone]. *Macalester Today*, 127, 12-15. Macalester College. <https://digitalcommons.macalester.edu/macalestertoday/127>
- Posner, M. I. (2012). *Attention in a social world*. New York, NY: Oxford University Press.
- Rey, V. M. (2019, Fall). Effects of engaging students in a remedial reading course. *Practitioner to Practitioner*. <https://files.eric.ed.gov/fulltext/EJ1246587.pdf>
- Sayegh, J., & Rigopoulos, A. (2022). Improving student learning outcomes through formally structured group projects. *Community College Journal of Research and Practice*. <https://doi.org/10.1080/10668926.2022.2043203>
- Southwick, S. M., & Charney, D. S. (2018). *Resilience: The science of mastering life's greatest challenges* (2nd ed.). Cambridge, UK: Cambridge University Press.
- Støle, H., Mangen, A., & Schwippert, K. (2020). Assessing children's reading comprehension on paper and screen: A mode-effect study. *Computers & Education*, 151. <https://doi.org/10.1016/j.compedu.2020.103861>
- Strom, P. S., Hendon, K. L., & Strom, R. D. (2023). Assessment of Internet learning for high school students.

- Journal of Educational and Developmental Psychology*, 13(1), 17-28. <http://doi.org/10.5539/jedp.v13n1p17>
- Strom, P. S., Hendon, K. L., Strom, R. D., & Wang, C-h. (2019). How peers support and inhibit learning in the classroom: Assessment of high school students in collaborative groups. *School Community Journal*, 29(2), 183-202. <https://files.eric.ed.gov/fulltext/EJ1236590.pdf>
- Strom, P. S., & Strom, R. D. (2016). *Polling students for school improvement and reform*. Charlotte, NC: Information Age.
- Strom, P. S., & Strom, R. D. (2021). *Adolescents in the Internet age: A team learning and teaching perspective* (3rd ed.). Charlotte, NC: Information Age.
- Strom, P. S., & Strom, R. D. (2023). *Learning polls for secondary school and college students: Selective Attention Poll*. <https://learningpolls.org>
- Strom, P. S., Strom, R. D., Sindel-Arrington, T., Rude, R. V., & Wang, C-h. (2021). Gender differences in stress of community college students. *Community College Journal of Research and Practice*, 46(7), 472-487. <https://doi.org/10.1080/10668926.2021.1873872>
- Strom, P. S., Strom, R. D., & Wang, C-h. (2022). Peer and self-assessment of teamwork skills in high school: Using a multi-rater evaluation method for cooperative learning groups. *International Journal of Educational Reform*. <https://doi.org/10.1177/10567879221082969>
- Strom, P. S., Strom, R. D., & Wing, C. (2008, December). Polling students about conditions of learning. *NASSP Bulletin*, 92(4), 292-304. <https://doi.org/10.1177/0192636508325512>
- Strom, R. D., & Strom, P. S. (2002). Changing the rules: Education for creative thinking. *The Journal of Creative Behavior*, 36(3), 183-200. <https://doi.org/10.1002/j.2162-6057.2002.tb01063.x>
- Turkle, S. (2016). *Reclaiming conversation: The power of talk in a digital society*. New York, NY: Penguin.
- Turkle, S. (2021) *The empathy diaries: A memoir*. New York, NY: Penguin.
- Whybrow, P. C. (2016). *The well-tuned brain: The remedy for a manic society*. New York, NY: W.W. Norton.
- Wing, C. (2007). *Student polling in rural Title I schools to inform required decision-making*. (Publication No. 3258192) [Doctoral dissertation, Arizona State University]. ProQuest Information and Learning Company.
- Wolf, M. (2019). *Reader, come home: The reading brain in a digital world*. New York, NY: Harper Collins.
- Wu, T. (2016). *The attention merchants: The epic scramble to get inside our heads*. New York, NY: Alfred A. Knopf.
- Yadusky, K., Kheang, S., & Hoggan, C. (2020). Helping underprepared students succeed: Minimizing threats to identity. *Community College Journal of Research and Practice*, 45(6), 423-436. <https://doi.org/10.1080/10668926.2020.1719939>

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